



Groundwater recharge in a mountain cloud laurel forest at the Garajonay National Park (Spain)

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Hydrometeorological studies are being developed for water resources assessment. at the Garajonay National Park located in Gomera Island (Spain). This National Park is unique for it consists of a mountain evergreen laurel forest, frequently covered by stratocumulus clouds during most of the year. Annual fog water amount can exceeds annual rainfall in Gomera Island. These wet conditions have assured a vegetation resembling that of the Tertiary, which due to climatic changes, has largely disappeared from southern Europe and established at the Macaronesian Islands. This forestry ecosystem plays an important role in controlling erosion processes and watershed hydrology, especially in such mountainous regions with steep slopes and relative large rainfall (700 mm/year). The study of hydrological processes is of extremely important because groundwater is the main water resource for the island, but technical difficulties are associated to assessment cause of volcanic geology. The aim of this study is to assess groundwater recharge, after rainfall and fog water intercepted by the vegetation through the canopy, by means of water balance technique. A small basin has been extensively monitored with rain gauges below the canopy, sapflow sensors, soil moisture probes (T.D.R.) at two different depths and weirs, in order to measure water inputs (net precipitation), water outputs (soil water evaporation and surface and subsurface runoff) and changes in water storage in the soil system. Data collected during 2003/04 have been used to construct a water balance model using VISUAL BALAN a code which solves daily the water balance equations in the soil, the unsaturated zone and the aquifer. The conclusions of this study will improve the current understanding of hydrological processes, conditions and especially of groundwater recharge in a representative watershed of the Garajonay National Park.