



Comparative analysis of base flow recession curves for different Andean catchments

P. Guzman (1,2), O. Batelaan (1,2), and G. Wyseure (2)

(1) Vrije Universiteit Brussel, Department of Hydrology and Hydraulic Engineering, Brussels, Belgium (batelaan@vub.ac.be, 0032 2 6293022), (2) K.U.Leuven, Department of Earth and Environmental Sciences, Celestijnenlaan 200e - bus 2410, 3001 Heverlee, Belgium

Little is known in the Paute River basin, Ecuador about the groundwater resources, the relation between aquifers and their recharge zones and interaction with rivers. The pressure from human activities in the river basin is increasing and impacting the surface water quality and quantity, therefore it becomes increasingly useful to estimate the potential of groundwater exploitation as an alternative resource. Due to the lack of specific groundwater data and information, assessment of suitable alternative methods for groundwater research at different scales is considered. In low flow hydrology literature it is noted that the majority of natural gains to streamflow during low-flow periods are derived from releases from groundwater storage, moreover baseflow is generally suggested to be an indicator of groundwater or other delayed sources. Analysis of flow recession curves allows the determination of characteristics of the groundwater reservoir, which is a prerequisite for the separation of baseflow from total discharge and the estimation of groundwater storage and recharge. The flow recession curve at a river cross section is defined as the discharge hydrograph of the basin during a rainless or dry period. Its analysis yields information on the retention characteristics of the basin and of groundwater storage and depletion.

In the Paute River basin baseflows are assumed to be originating from Paramo storage, which is largely determined by the high water retention capacity of the soils in combination with their slopes. In the case of the sub-catchment of the Tarqui River, there are evidences based on topography, hydromorphology, discharges and soils that suggest the presence of a major aquifer in the valley. Hence, the goal of this contribution is the comparison and analysis of groundwater conditions based on baseflow recession analysis for the Tarqui and Yanuncay River sub-catchments. Baseflow analyses are translated in recharge and groundwater resources characteristics, as well as relationships with land cover, morphology, geology and rainfall are established and presented. The results are discussed within the framework of increasing pressures on the water system.