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{Baseflow index regionalization analysis in a Mediterranean area and data scarcity context}

A. Longobardi and P. Villani

Università di Salerno, Ingegneria Civile, Fisciano (SA), Italy (alongobardi@unisa.it, 0039-089963408)

Low flow characteristics are affected by different physiographic factors such as climate, topography, geology and soils, and regional regression prediction models, to estimate low flow indexes at ungauged sites, mainly rely on these factors. The present study focuses on the baseflow index, one of the most important low flow characteristics for a catchment, and presents: i) the analysis of baseflow separation algorithms for BFI evaluation and ii) a regional approach to predict the BFI at ungauged sites in a Mediterranean region, for which only very poor data are available. As showed in Longobardi and Villani (2008), the prediction of baseflow contribution to total streamflow is based on the introduction of a permeability index at the catchment scale, and regional linear regression equations simply relate the latter to the BFI. Initially defined on the base of a hydro-geomorhological classification, successfully used for flood prediction in ungauged sites, the permeability index is computed on the base of an apparently over-simplified scheme which only account for lithological and hydrogeological characteristics of the studied region. Its computation does not require extensive soil surveys, being thus particularly suited for very poorly gauged sites. The case study here presented is represented by 29 stations, ranging in area from 13 to 5500 km^2, located within a region of about 20.000 kmq, in Southern Italy. Catchment lithology appeared to be the major factor affecting baseflow in the studied area, and it is shown that an accurate catchment geology spatial variability description reduces the average long term BFI index prediction error from 23% to 14% and above all increases the explained variance from 23% to 68%.