

Evaluation of Three Digital Graphical Methods of Baseflow Separation Techniques in the Tekeze Water Basin in Ethiopia

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Abstract : The purpose of this work is to specify the parameter values, the base flow index (BFI), and to rank the methods that should be used for base flow separation. Three different digital graphical approaches are chosen and used in this study for the purpose of comparison. The daily time series discharge data were collected from the site for a period of 30 years (1986 up to 2015) and were used to evaluate the algorithms. In order to separate the base flow and the surface runoff, daily recorded streamflow (m^3/s) data were used to calibrate procedures and get parameter values for the basin. Additionally, the performance of the model was assessed by the use of the standard error (SE), the coefficient of determination (R^2), and the flow duration curve (FDC) and baseflow indexes. The findings indicate that, in general, each strategy can be used worldwide to differentiate base flow; however, the Sliding Interval Method (SIM) performs significantly better than the other two techniques in this basin. The average base flow index was calculated to be 0.72 using the local minimum method, 0.76 using the fixed interval method, and 0.78 using the sliding interval method, respectively.

Keywords : baseflow index, digital graphical methods, streamflow, Emba Madre Watershed

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