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Regionalisation of low flow frequency curves for the Peninsular Malaysia

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Abstract

Regional maps and equations for the magnitude and frequency of 1, 7 and 30-day low flows were derived and are presented in this paper. The river gauging stations of neighbouring catchments that produced similar low flow frequency curves were grouped together. As such, the Peninsular Malaysia was divided into seven low flow regions. Regional equations were developed using the multivariate regression technique. An empirical relationship was developed for mean annual minimum flow as a function of catchment area, mean annual rainfall and mean annual evaporation. The regional equations exhibited good coefficient of determination ($R^2 \geq 0.90$). Three low flow frequency curves showing the low, mean and high limits for each region were proposed based on a graphical best-fit technique. Knowing the catchment area, mean annual rainfall and evaporation in the region, design low flows of different durations can be easily estimated for the ungauged catchments. This procedure is expected to overcome the problem of data unavailability in estimating low flows in the Peninsular Malaysia. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Frequency curve; Low flow; Mean annual evaporation; Mean annual rainfall; Regionalisation; Regression analysis and ungauged catchment

Index Keywords

Annual rainfall, Frequency curve, Low flow, Mean annual rainfall, Ungauged catchment; Evaporation, Regression analysis, Runoff, Vapors; Catchments; catchment, evaporation, frequency analysis, low flow, mapping, precipitation assessment, regionalization, regression analysis; Malaysia, West Malaysia

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