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Hydrology and Earth System Sciences Discussions

Interactive comment on "The role of climatic and terrain attributes in estimating baseflow recession in tropical catchments" *by* J. L. Peña-Arancibia et al.

Anonymous Referee #1

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General comments Based on available dataset, this paper tried to build the relationship between base flow recession parameters and climatic and terrain attributes, assuming linear reservoir for groundwater storage-discharge. Then the derived relationship (such as the exponential equation linking kbf to mean annual rainfall rainfall) is used to estimate recession parameters in ungauged tropical and subtropical catchments. The analysis is not innovative in terms of methodology. However, the results from this paper are useful for the applications of global hydrologic models.

Specific comments 1. Since the base flow recessions in many catchments have been

found to be nonlinear, the authors may need to assess that for the study catchments. At least, the authors should show some details on the estimation of Kbf, such as the fitness of the linear model for log(Q) versus t, the values of εMRE, and the variance of the recession constant from many observed recession segments.

2. The regression analysis is based on single variable instead of multivariable analysis, such as MAR or AI. MAR and AI together only explain 49% of the variance. Other variables which are not included in the analysis may explain the rest of the variance, and multivariable regression will improve this. It is necessary for the authors to discuss this for future work.

The authors did an analysis of clusters of catchments of smaller size. To improve the performance of regression, cluster analysis can be conducted first; then the regression can be done for each cluster.

3. Catchments with dams, substantial LCC and snow cover have been excluded for analysis. Are there any other human activities in the study catchments such as groundwater pumping and urbanization which can also affect the base flow recessions?

4. Lines 16-18 in page 4061, "The use of drainage .....". Why? More discussion or reference is necessary.

Technical corrections: 1. Line 21 in page 4062, delete "to" in "are to: ..." 2. Line 18 in page 4063, change "start" to "starts" 3. Lines 18-19 in page 4063, any references of the use of the TQF5 or justification of it? Does the TQF vary with catchments? 4. Line 6 in page 4064, "t" is missing in equation (3). 5. In Table 1, "MAE" should be "MAR"? 6. Line 19 in page 4071, should the ";" be changed to "," ?

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