

Interactive comment on “Regionalization of patterns of flow intermittence from gauging station records” by T. H. Snelder et al.

Anonymous Referee #3

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General comments The manuscript deals with an important topic on flow intermittence. This is crucial for decision making and/or policy framing in water resources management, planning and development, and especially in the area of determining environment flows. The authors use known statistical methods to derive relationships between flow intermittence and physical basin attributes. The manuscript is thus technically sound and managed to draw conclusions that are scientifically defensible, though the results could have been intuitively expected. The quality of the presentation is also commendable.

Specific comments 2. Materials and methods Page 1516 Line 7: The use of latitude only is hardly adequate to locate the study area Page 1517 Line 2: the choice of 20 days needs to be qualified. Why choose 20 days as the threshold? Page 1517 Line

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8: “.. the frequency of zero-flow periods...”. Does this mean that a period of 1 day would be treated in the same manner as a period of 19 days? Page 1517 Line 22: use words rather than this symbol \sim . I suppose that means ‘about’ or ‘roughly’. There are a few more places in the text where this symbol is used. Page 1518 Lines 24-25: Why use a “drainage density that was independent of our DEM-based network”? I would have expected that the same network used in the study would be used for estimation of the drainage density. There is need for consistency here, especially given that the two are likely to give different densities. The authors need to justify why they used a different network for the drainage density. Page 1519 Line19: delete ‘retained for analysis’. There is no need to have that phrase and it is a repetition as it has already been mentioned in the sections before this one. Page 1519 Lines 23-26: the line beginning ‘In the intermittence.’ is difficult to follow. Rephrase Page 1519 Line 26: ‘We grouped the 123 gauging.’, The figure 123 just pops out of nowhere. There is no mention of 123 gauging stations being on intermittent segments in the text before this. Some statement relating to this should be inserted somewhere in the text. Page 1520 Line11: Delete the first ‘dissimilarity’ so that the statement reads ‘Our first matrix described the dissimilarity.’ Page 1520 Lines 14-15: A brief explanation of how the permutation procedure would establish the significance of the statistic would be desirable here. Page 1520 Lines 19-21: Replace ‘due to’ with ‘as a result of’. Also here I do not understand how “.... station record had not commenced or had ended” is a problem. Some justification is required here. Section 2.7: this section is rather too long and over-detailed with a lot of descriptions of the methods but very little reference to the subject of the paper. Such detail is not necessary and should be reduced. Relate the descriptions to the intermittence subject at hand. Page 1525 Lines 9-10: Difficult to follow. Rephrase. Page 1525 Lines18-20: What is the justification for assigning the three outliers to the closest subclasses? How important are these outliers? Is there any common thread running through the outliers? These outliers should be discussed a bit more as they could be significant in assessing the methods used. Page 1526 Line1: See my comment above with regards permutations. The method is mentioned

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in passing but it seems to have a bearing on the results. A statement describing the method would suffice. Page 1526 Lines 25-27: Delete the second ‘river’ to read ‘... 39% of river segments represented by our network.’ Page 1527 Line 1: What does ‘higher level of accuracy’ really mean? The statement on its own is meaningless and should be qualified by an additional statement. Page 1527 Lines 6-20: Very good results. This is a significant part of the study. My concern is that the discussion of these results is missing even in the discussion section. Page 1528 lines 1-6: it seems to me that this paragraph is a repetition. Check that the same thing has not been said in the preceding sections. Page 1529 Lines 7-9. The statement beginning ‘The probability of...’ does not read well. Rephrase. Page 1533 Line 4: The use of the word ‘accurately’ must be qualified. What does ‘accurately’ mean? Page 1533 lines 10-12: Rewrite the line to read ‘..... preliminary estimates of how climate change could impact the frequency of’

Table 1: variables Allu, Chalk, Lime all have the same description. Figures 1 & 6: the captions are not informative enough. One would have to go back to the text to understand the figures. Figure 3: is squashed and difficult to read. An increase in size may help, or a re-labelling of the x-axis.

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