

Interactive comment on “Impacts of climate change on the seasonality of low flows in 134 catchments in the River Rhine basin using an ensemble of bias-corrected regional climate simulations” by M. C. Demirel et al.

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The aim of the paper is an assessment of an influence of climate change on the seasonality of low flows in the River Rhine basin. A simulation approach is applied, based on bias-corrected outputs from seven climate scenarios as input to the hydrological model (HBV). Three seasonality indices are used following earlier work on that subject. These are the Seasonality Ratio, Weighted Mean Occurrence Day and Weighted Persistence. The authors have successfully managed to present a complex investiga-

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tion study, involving a large number of simulations carried out in 134 catchments of the River Rhine basin in a clear and meaningful way. The most interesting (and informative) part of the analysis is the influence of geomorphological characteristics of the catchments on the low flow indices and their future changes. There are only a few descriptions to tidy up (listed in the specific comments). The questions that one could ask are about the experimental set-up and the conclusions drawn.

The authors decided to analyse five GCM/RCM outputs following the A1B greenhouse gas emission scenario and two other emission scenarios, A2 and B1, represented by single GCM/RCM outputs. The first question is that those scenarios are not equally probable. In their conclusions the authors should distinguish between different gas emission scenarios rather than treat them as equally probable. This distinction should be clearly stated in the conclusions. At the moment Table 4 is not easy to understand and might be misleading.

The other important point is the inter-relationship between the low flow indices used in the study. The authors are asked to discuss that issue both from the theoretical and experimental points of view. The same question regards the GCM/RCM outputs. It would also be of interest to see how the scenario inputs are correlated.

The authors summarise their analysis using the word “uncertainty” meaning “variability”. From the conclusions only, one can wrongly understand that an uncertainty analysis was carried out, whilst the paper presents only an analysis of possible variations in low flow indices based on the very few simulation results. I would suggest changing the word “uncertainty” in the conclusions (page 6828) to “variability” and/or comment on that issue.

Specific comments: The values of Q75s, Q75w and Q75 for each catchment should be presented in a table. Page 6818, lines 19-20: should be: ... (2010) using the following equation for precipitation: Page 6818, line 27: ... (Eq. 9) Page 6819, lines 1-2: ... outputs for temperature have been corrected by using the equation: Page 6819,

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line 9: By using Eq. (10) the mean ... Page 6821, line 5: Further, in Fig. 2 we present ...

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