Hydrology and Earth System Sciences Discussions

Interactive comment on "**Are droughts occurrence and severity aggravating? A study on SPI drought class transitions using loglinear models and ANOVA-like inference**" *by* **E. E. Moreira et al.**

B. van den Hurk (Editor)

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The revised manuscript has really been improved in response to the editorial and reviewer comments. However, as indicated, the reviewers will be asked to have another look at the new manuscript. My editorial comments on the manuscript as it is presented now, found below, can be included in a revision that will be expected after the reviews have been completed. These comments are:

- In the abstract confusion is generated by discussing the number of sub-periods (which is not relevant at this stage) and ill-defining the nature of the 2-dimensional

contingency table (which is relevant)

- the hypothesis formulated in statistical sense in section 3.2 must be formulated in physical/logical terms at the end of the introduction section. Something like: "we're testing whether the persistence or changes in the drought regimes are statistically different between different sub-periods over the 20th century, in order to assess the presence of trends or cyclic behaviour in these drought regimes."

- a lot of text is devoted to the subdivision into periods. It would make more sense to say that you're choosing sub-periods of roughly 25 years based on a set of homogeneity criteria

- the last paragraph of section 2 is difficult to understand

- A reference to table 2 must be added in the figure captions of fig 2 and 3

- The rationale of applying and fitting a loglinear model is not clear to me. Why couldn't you do the testing on the raw m_{hj} values?

- A lot of statistical terminology is used in e.g. section 3.2 that are not very meaningful to non-statisticians ("fixed effects models", "non-centrality parameters"). Please keep a physical point of view when explaining the method

- Table 4 would be much better when presented in graphical form, e.g. using histograms of F-statistics and significance levels.

- The description of the main findings in section 4 could be very nicely illustrated by color-coding the stations in Figure 1, where each color is used to classify the type of trend/cyclicity/persistence that is discussed in this section. This immediately will illustrate the spatial coherence of the various types.

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- The explanation in figure 4 is useful, but it seems that a distinction between a positive and a negative trend cannot be made using these m_{hj} values as they show exactly the same signature.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 11277, 2011.