

## ***Interactive comment on “Global patterns of change in discharge regimes for 2100” by F. C. Sperna Weiland et al.***

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### Comments:

The paper presents interesting results from the combination of experiments with multiple GCM forcing the PCR-GLOBWB. In general the results for identifying changes in discharge regimes and their patterns are valuable. The paper discusses important conclusions related to the changes in the 21st century that are based on the use of conventional statistics. The comparison of previous research and their individual conclusion is clear and a good piece of the state of the art for the global analysis and climate change research, even if this information shows to have no clear trend or coherence between paper results. It is well known that the high complexity of the results

from global modeling makes unreliable conclusions obtained from simple means, maximum or minimum of time series. Not only because they GCM models have high bias and their sensitivity to the initial conditions is high, it is also well known that the hydrological model used will be much more sensitive to weather conditions in some regions of the planet than in others. This is related to how much is one cubic meter in the Sahara and how much is for the Amazonia. So relative local measures or statistics need to be somehow weighted to be able to compare spatial patterns. This will have important variations on the conclusion that might mix the weakness and strengths of the model (which is not calibrated) with the real problem. I believe that the statistical approach used might not be the right decision and pattern recognition techniques on individual spatial analysis should be performed using technique like the ones suggested by the papers of Corzo et al., 2011 or Lloyd-Hughes 2010. In my opinion, the paper as it is now requires to better define the limitations and assumption of the approach. Aside of the major and minor comments of the other reviewers, I believe the use of a graphical representation of the experimental process would be of great help.

Corzo Perez, G. A., van Huijgevoort, M. H. J., Voß, F., and van Lanen, H. A. J.: On the spatio-temporal analysis of hydrological droughts from global hydrological models, *Hydrol. Earth Syst. Sci.*, 15, 2963-2978, doi:10.5194/hess-15-2963-2011, 2011

Lloyd-Hughes, B.: A spatio-temporal structure-based approach to drought characterization. *Int. J. Climatol.*, doi:10.1002/joc.2280, in press, 2010.

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Interactive comment on *Hydrol. Earth Syst. Sci. Discuss.*, 8, 10973, 2011.

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