

Reply to Interactive Comment made by L. Zhou (Referee #2)

Hydrol. Earth Syst. Sci. Discuss., 9, C6593–C6594, 2013

4 February 2013

Our reply is in italic

We thank Dr. Zhou for his positive opinion.

This paper set up a controlled modeling experiment to investigate the impact of climate and physical catchment structure to hydrological drought. The experiment program designed in this work is detailed and logical and the climatic data derived from WATCH Forcing Data is valuable. The combination of conceptual hydrological model and simple spatially lumped groundwater model is reasonable and effective for the investigation of large scale hydrological drought mechanism, although some assumption is idealized, even may inconsistent with actual situation. The quantitative results from statistical analysis strongly supported the conclusions in this article, and the discussion and conclusion is very interesting. The authors use Köppen-Geiger climatic map to randomly select the land grid cells for hydrological model running. I suggest adding the distribution map of selected random points to illustrate the spatial representativeness of selected random points.

- 1) *We agree with the reviewer that the selected conceptual hydrological model has a rather simple structure, but we believe that the model includes all relevant components to demonstrate that the groundwater response plays a major role in the transformation from meteorological drought to hydrological drought and that it is equally important as climate (see also reply to comments from Dr. Hagemann and the 3^d reviewer).*
- 2) *As suggested by Dr. Zhou we have added an annex to the paper, which provides a global map showing the locations of the selected 1495 cells. This map proves that the cells are well distributed across the globe and the major climate types.*

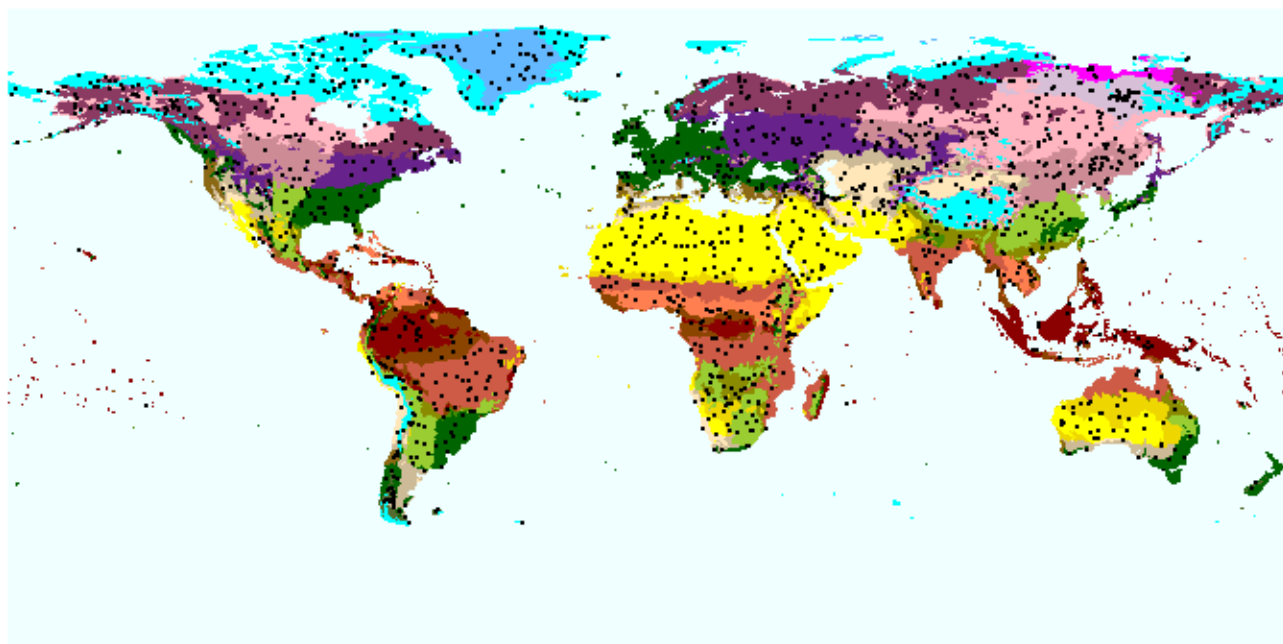


Figure Spatial distribution of the selected grid cells over the world.