

Interactive comment on “Updated world map of the Köppen-Geiger climate classification” by M. C. Peel et al.

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The original comment is in *italics* and the response is in **bold**.

Interactive comment on “Updated world map of the Köppen-Geiger climate classification” by M. C. Peel et al.

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Updated world map of the Köppen-Geiger climate classification M. C. Peel, B. L. Finlayson, T. A. McMahon

This is an excellent paper - the authors have painstakingly analyzed all available precipitation and temperature data and updated the Köppen-Geiger climate classification, and in doing this, have made a major contribution to both the climate and hydrology

communities.

The authors thank Prof. Sivapalan for his very positive comment.

This work is timely, in that there are strong efforts to develop a classification system for catchment hydrology under the PUB (predictions in ungauged basins) initiative. I know of a few preliminary papers discussing the merits of such a classification scheme, and a journal article (Wagener et al., soon to be published in Geography Compass) presenting a possible framework for this classification. Clearly, the starting point for the catchment hydrology classification is indeed the Koppen (climate) classification.

One of the first indicators (similarity variables) suggested by Wagener et al. (and others) is Budyko's climatic dryness index, which is the ratio of annual precipitation to annual potential evaporation. Assuming to first order that temperature is a good surrogate for potential evaporation, then the same numbers used in this updated Koppen classification can be used to estimate the dryness index (if we can agree on its precise definition), and this can then be mapped. The second strong climate indicator is the seasonality of precipitation and potential evaporation (in a relative sense) and again this can be estimated and mapped.

We can then see associations between the climate indicators and measures of water balance globally - which could be a future endeavor. Another obvious manifestation of climate and hydrology (apart from streamflow) is vegetation patterns, which in broad terms has been related to precipitation and temperature (Woodward, 1987), which has been alluded to in this paper also.

So, overall, I think this paper is a welcome addition which I hope will trigger further work towards a global hydrologic classification. I have carefully read the details of the analysis - I have no problems with the approaches used and decisions made in difficult situations. I am also thrilled that they have made all the data they used available on line - this will help further extensions.

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Again, the authors thank Prof. Sivapalan for his very positive comments.

The only change that I would ask the authors to do is, this being a hydrology journal, to make comments and guidelines regarding how the Köppen classification system can be extended to include hydrological impacts of climate, since this is now topical. The authors themselves have previously worked on this, e.g., Haines et al. (1988). I invite them to refer to the commentary-type papers by McDonnell and Woods (2004) and Woods (2003, 2004, 2005, 2006), and others.

How to extend the Köppen classification system to include hydrological impacts of climate is a vast area on which to make comments and guidelines. Considering the aim of the paper, which is to present an updated version of the world Köppen climate map, and the already lengthy nature of the paper, such comments and guidelines, we believe, are beyond the scope of this paper. However, in providing an updated version of the map, details of the Köppen classification process used and making the results freely available on the web, we believe that the hydrologic community is now in a much better position to investigate extending the Köppen classification system to include hydrological impacts of climate.

I have no hesitation in recommending that the paper be published in HESS without much further delay.

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