

Interactive comment on “Global hydrobelts: improved reporting scale for water-related issues?” by M. Meybeck et al.

Anonymous Referee #2

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The authors propose a division of global landmasses into several hydrobelts – regions characterized by relatively uniform internal hydrological and climatic characteristics and essential differences from each other. They suggest that the resulting geographic division should be used as the basis for reporting hydrological data instead of the currently applied political (based on countries' borders) or continental (based on continents' borders) or other types of divisions. It is crucially important to have an objective physically justified basis for geographic analysis of hydrological data and I very much welcome publication of these results. I have a few comments that the authors might wish to take into account in the final HESS version of their study.

1. The main condition for hydrobelts delineation (p. 9124) is that individual river basins

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may not be cut between two different hydrobelts. Suppose we have a number of river basins covering the entire landmass of the Earth. The task performed by Meybeck et al. consisted in combining the adjacent basins together in such a manner that the resulting variability of annual temperature and runoff within the resulting groupings, Fig. 1, is minimized, while the difference between groupings is maximized.

It would be good to have a discussion of some *quantitative* indicators of minimizing the internal differences and maximizing the external ones. This would help to quantify the degree of subjectivity involved in defining the hydrobelts. For example, if a different set of researchers independently decided to define hydrobelts according to the qualitative criteria of Meybeck et al. (p. 9124), would they with a 100% probability end in the same division? If not, to what extent and in which aspects their division could differ from that of the present authors?

For example, the authors mention that in some cases the attribution of particular river basins to one or another hydrobelt was a subtle procedure (p. 9136, lines 5-10; p. 9141, lines 15-20). Perhaps it is here that the discussion could be extended to explain which quantitative criteria were used to reach one or another decision.

2. I agree with the suggestion of Dr. Roderick that it would be very instructive to have a table with per capita water availability across the hydrobelts and hydroregions.
3. Since COSCAT as a term was defined in previous papers but is referred to several times through the text and in the Appendix, it would be good to explain this term in somewhat greater detail.

p. 9137, line 19: it is needed to insert LESS and close the brackets: (maximum to minimum monthly discharge ratio LESS than three for the Amazon and less than two for the Congo, having the steadiest river regime.)

Fig. 6: units of runoff should be mm/year