

Interactive comment on “Technical note: Towards a continuous classification of climate using bivariate colour mapping” by A. J. Teuling

Anonymous Referee #3

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General comments

The paper is a technical note on continuous classification of climate using bivariate colour mapping. It addresses questions of climate classification and visual presentation through maps, which is of general interest to the scientific community but may be of less relevant to the overall hydrology-orientation of HESS.

Whilst the paper presents a novel concept of climate classification with the help of visualisation via colour mapping, it is less clear on why this is necessary and what is the added value of this technique compared to the classical Koeppen classification. The abstract is too brief to provide a complete summary. A definition of climate is lacking in the abstract and introduction.

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Specific Comments

The paper is based on data from the Climate Research Unit. The quality of the data set is not discussed (e.g. are any remote sensing data used?). The methods and assumptions are not clearly outlined and their description is incomplete, e.g. there is no discussion of why temperature and relative humidity was chosen (instead of precipitation and temperature?) why and for what purpose a 10 minute resolution was chosen, whether all data were taken at 10 minute intervals simultaneously worldwide for the same time periods, why the period from 1961-1990 was chosen and for which grid size. The author does not explain why the De Bilt and Madrid examples were restricted to a nine-year period whereas the Koeppen periods are averaged over at least 30 years. No credit is given to the original Koeppen work and there is no discussion of other climate or hydroclimatological classification systems. Shortcomings such as the lack of quantitative comparison of the results are not mentioned in the introduction.

In the classification scheme, there is no discussion on the difference between for example relative humidity and water availability, which ultimately determines climate. There is also no discussion on how the author deals with the high variability in relative humidity and how this is influenced by temperature e.g. for the saturation point. What does an “indirect” dependency on RH mean for the results?

The comparison of Madrid and De Bilt is rather incorrect, the winters do differ strongly between the two according to the graphs and real situation.

It is difficult to assess whether the results are sufficient to support the conclusions, since the paper is based on a visual comparison rather than a numerical analysis.

Since this is a technical note, the conclusions are brief. They lack some crisp science. The conclusions show that a continuous temporal and spatial classification of climate is possible; however the statistical accuracy of this method compared to the original Koeppen maps is not discussed. The paper demonstrates that it is possible to apply maps from a computer model, however without developing accurate results.

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The basic paradox of this paper is the difference between climate and weather. There seems to be some confusion over the implications of these two terms, since one is the long term average and the other considers short term fluctuations. It may be that the method proposed is more relevant to weather rather than to a climate classification, since climate is not defined in minutes and hours. Part of the paper is already published in the Journal of Climatology.

Presentation Quality

The language throughout the technical paper could do with more scientific sincerity.

The limited quality and small size of maps do not enable any meaningful comparison to be made between the original Koeppen and the new classification. Topography and continents cannot be clearly distinguished. The Tibetan plateau is misrepresented, with much lower temperatures than for Koeppen and South America does not seem to reproduce the subtle variability shown in the Koeppen classification. The differences between the two should be explained in much more detail with an error analysis. There are contradictions in the paper e.g. the maps are described as “different” and then as “surprisingly similar”.

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