

***Interactive comment on “Technical note:
Long-term memory loss of urban streams as a
metric for catchment classification” by
Dusan Jovanovic et al.***

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Received and published: 12 January 2018

We thank Dr Rao and Mr Bertassello for reviewing our manuscript and providing useful comments. The review focuses more on rainfall and the role of rainfall statistics in relation to urbanization. In highly urbanised catchments, rainfall is rapidly transferred to streams, thereby suggesting that the H-exponents of rainfall and streamflow time series should have values close to each other. Conversely, the ability of more natural catchments to store and lose water while slowly releasing it to streams should introduce a longer memory on the streamflow time series when compared to rainfall. This is in agreement with the results already presented in Jovanovic et al. (2016), who used

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the same US catchments of the present study to show that the scaling properties of quickflow in these station were similar to those of some rainfall stations in the same area. In the present study, although an interesting research idea, we cannot provide a full analysis of rainfall and streamflow statistics, because we do not have enough rainfall stations in the USA (in addition to those already used in Jovanovic et al. (2016)) and Australia to compare with the streamflow stations. Furthermore, the main focus of our technical note is to show that catchments can be classified in different categories of urbanization levels solely by using the H-exponent of streamflow series. This exponent can be estimated in relatively simple ways from streamflow series, which are becoming increasingly more available from water management agencies. We used streamflow series from the USA and Australia to show that a relationship between the H-exponent of streamflow series and the fraction of catchment impervious area could be found in parts of the world with different climatic conditions. The issue of urbanization altering rainfall patterns is interesting but outside the scope of our technical note. We will expand the sections with discussion and conclusions to better explain the link between streamflow and rainfall, and to provide the suggestion of analysing the link between urbanization levels and rainfall.

References: Jovanovic, T., Mejia, A., Gall, H. & Gironas, J. 2016. Effect of urbanization on the long-term persistence of streamflow records. *Physica a-Statistical Mechanics and Its Applications*, 447, 208-221.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2017-613>, 2017.

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