

Interactive comment on “Evaluation of catchment connectivity and storm runoff in flat terrain subject to urbanisation” by O. V. Barron et al.

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Scientific Significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Hydrology and Earth System Sciences (substantial new concepts, ideas, methods, or data)?

The paper presents some interesting data and analysis that furthers scientific understandings of runoff generation and dynamics, particularly concerned with development and management practices of catchments.

Scientific Quality: Are the scientific approach and applied methods valid?

Yes although I would like more justifications of runoff being driven by filling depressions
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in the estimation of catchment runoff. This is not always the case in semi-arid regions in intense rain and hence should be better justified.

Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?

I have only given this a 3 because I am not convinced about the way the term connectivity is used within the paper. I understand the concept of hydrological connectivity to be more about the ways in which runoff is connected and transmitted in river catchments (see Bracken LJ and Croke J 2007 for more details). I see this paper much more about exploring changes in contributing area. This is obviously related to the development of hydrological connectivity within a catchment and hence implicitly related and hence could be discussed in this way later in the paper. Hence I am not convinced that the title accurately reflects the content of the paper and would suggest a title of ‘Evaluation of changes in catchment source areas and storm runoff in’. There are also statements, for example in the abstract, that urbanisation increases connectivity. I’m not sure this is known yet and don’t think that the papers reports this and so would be happier if using this phrasing was revised/removed. In the introduction notions of pathways of water transfer are introduced, but connections between expansions in urban area need to be more explicitly related to increases in connectivity. For instance a new housing estate could be built a long way from any streams and on top of a hill surrounded by areas of high infiltration. This would increase contributing area, increase runoff from this area but is not necessarily well connected into the drainage network and will therefore have limited contribution to flood flow.

Presentation Quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)? Yes.

Hence I’d suggest major revisions – just to reposition the paper slightly.