

## ***Interactive comment on “Contribution of directly connected and isolated impervious areas to urban drainage network hydrographs” by Y. Seo et al.***

### **Anonymous Referee #1**

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General comments: This study calculates drainage runoff hydrographs considering the effects of infiltrated rainfall and directly connected and isolated impervious area. The observed recession of the hydrographs in urban areas indicates the modeling deficit of most hydraulic models like SWMM. The suggested approach of conceptual hydrologic modeling effectively improves the simulation of the recession and water balance in urban areas. In spite of the limited number of observation, the paper suggests the need to consider the amount of water in urban areas, which has not been considered in the typical hydraulic and hydrologic modeling in urban areas. Moreover, considering the connectivity of impervious areas in urban catchment and evaluating the effect of directly connective impervious area (or effective impervious area) is important but not has been reflected in the modeling approaches. Therefore, the modeling approach

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suggested in this paper can be a start to incorporate this in urban hydrologic modeling. However, since parameter (2 parameters in the suggested approach) calibration is still required in the suggested model, I wonder if some simple conceptual approach might be possible without model calibration processes. Of course, I agree with the authors in that the actual process underneath the urban surface cannot be explicitly explained because of the complexity and hydrologic models are necessary and clearly graining grounds at this point.

Minor comments:

Line 7, page 6 Is the assumption of a wide rectangular channel geometry, which is mostly appropriate for natural channels, still appropriate for urban drainage systems? Since most urban drainage systems have geometry, which is not that wide, it might be cautious to apply the same assumption.

Line 15, page 6 Assuming the drainage network consists of pipes with circular cross-sections might conflict with the Van de Nes's original assumption.

Line 21, page 7 Assuming the drainage network flow as an open channel flow can be an issue, because of the pressurization of the drainage system. The authors need to clearly mention the limitation of the suggested approach in the discussion or conclusion section.

Line 23, page 12 It is nice to incorporate the effect of DCIA, which is often referred to as effective impervious area in other literatures. The connectivity of impervious areas in urban areas is receiving more and more attention in terms of hydrologic modeling. I noticed some literatures about the effective impervious area, especially the methodology to estimate this. The authors need to study further on this topic and discuss more about this.

For example, the authors should refer to following articles:

Roy and Shuster, Assessing impervious surface connectivity and applications for wa-

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tershed management, Journal of the American Water Resources Association, 45(1), 2009

Han and Burian, Determining effective impervious area for urban hydrologic modeling, Journal of hydrologic engineering, 14(9), 2009

Line 2, page 10 Assumption of a two-parameter inverse Gaussian needs further discussion. I understand that the proper formulation of the delayed response can be difficult. However, the author should provide more background on this or clearly mention the limitation of this assumption in the discussion and conclusion section.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 5605, 2013.

**HESSD**

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