

## ***Interactive comment on “Prediction of geomorphologic parameters of catchment without GIS to estimate runoff using GIUH model” by P. Keshtkaran and T. Sabzevari***

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Received and published: 21 May 2016

Answers to referee 1

Dear reviewer, Thank you very much for your attention and response. we have corrected our paper (“Prediction of geomorphologic parameters of catchment without GIS to estimate runoff using GIUH model”). In the following, you can find our responses.

Question1: The purpose of this paper is to calculate GP without DEM, how could we obtained the catchment area (A) and the length of main stream (L)? Answer 1: In order to create a suitable digital elevation model (DEM) high quality aerial maps or topographic maps are needed. Since the preparation of such maps is usually costly,

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there are many watersheds that lack DEMs. However, for most urban and rural areas in the world 1:25000-scale topographic maps now exist so that the watershed boundary can be delineated and consequently the values of watershed area and main stream length can be estimated with a good approximation.

Question2: From the Fig.9 and Fig. 10 we could find that in the four events, calculated peak flow was lower than Observed peak flow for three events. Is these mean that some other factors affected the GIUH?

Answer 2: The key question of the respected reviewer can be applied to any other rainfall-runoff model. It is clear that there has been no model considering all effective factors on rainfall-runoff transformation. Regarding our particular model, most GIUH models need excess rainfall as an input. Infiltration parameters values are different from one event to another. The computation of excess rainfall is quit complex, therefore the resultant errors can also affect the model results. In our study all watershed parameters were assumed to be constant and given this assumption geomorphologic parameters were calculated. Additionally, we tested our model for four events. Our results, in our opinion, do not mean that the model will underestimate the peak discharge for any other cases.

Question3: Page 6 Line 133-134 What do the characters “a” and “b” denote? Answer 3: Parameters a and b are constants of Eq. 4.

Question4: Page 11 Line 219-221: When the Eq.(12) indicates it can be applied in small catchment which is less than 200km<sup>2</sup> ; how can we know it can be used in those watersheds beneath 600 km<sup>2</sup> ? Answer4: To derive the regression equation (Eq. (12)) we used the information collected from 80 watersheds with an area ranging from 1 to 600 km<sup>2</sup>. Accordingly, it is recommended that the equation be used for the watersheds smaller than 600 km<sup>2</sup>. In addition, line (219-221) was revised as follows:

"Eq. (12) indicates that in small catchments with area less than 600km<sup>2</sup>, the value of RB runs between 3.47 and 4. It is suggested that Eq. (12) be applied to catchments of

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areas beneath 600km<sup>2</sup>."

Question5: Technical corrections: Page 19 Fig.10 (a): The legend was omitted

Answer5: Fig. 10(a) was completed as below:

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-153/hess-2016-153-AC1-supplement.pdf>

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-153, 2016.