

***Interactive comment on “Analyzing the  
relationship between peak runoff discharge and  
land-use pattern – a spatial optimization  
approach” by I.-Y. Yeo and J.-M. Guldmann***

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The present paper tried to integrate hydrological and land management processes with each others in order to achieve a model by which the watershed export runoff could be estimated under different land use scenarios. The developed model of IHLUO consisted of many inputs to some of which very default values have been assigned. The formulation of the optimization problem and application of Taylor's series in its linearization have been made soundly and nicely. Besides that, many assumptions have been considered by which this amalgamation could be materialized. Regretfully, the simplified conditions in the given example and mentioned in page 3554 and lines 1 and 2

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can rarely be found in real conditions. There is another important subject which has not been considered in the study that mainly refers to neglecting social and willingness of watershed residents. The optimal allocation of land uses has been just made based on physical constraints and not even in comprehensive manner. In the present study two important and very effective and variant dummy variables of CN and Manning's Co-efficient have been used to run the simulation model, whose application always need high level of precaution and precision. How the lumped CN method has been used for spatial study while it's input data are given as averaged values? though it's simplicity and accuracy, particularly in other countries rather than USA where this model has been originally developed, needs cautious judgment. Have you ever considered any routing or decay component through flow path? In the other words how certain is the simple summation procedure of runoff volumes from the top to the bottom of the route? Too much explanation was given about model development and governing conditions but no comparison was made with real data for the study watershed. Other specific comments, suggestions and corrections have been annotated in the context. In overall, the presented paper has been well arranged and organized but its final approval for publication totally depends upon satisfying, considering or justifying all opinions mentioned in the cast of general or specific comments. I recommend publishing it after subjecting it to major revision, since the application of optimization model in watershed management still is emerging and very necessary for watershed managers. I hope my suggestions would be of use to the respected authors and journal editorial board.

There are some other suggestions and questions arisen at time of studying and reviewing the paper which have been annotated on the attached pdf file.

Please also note the Supplement to this comment.

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