

Validation of an Infiltration Model Using Intermittent Waterfall Occurrence Data in Volcanic Jeju Island, Korea

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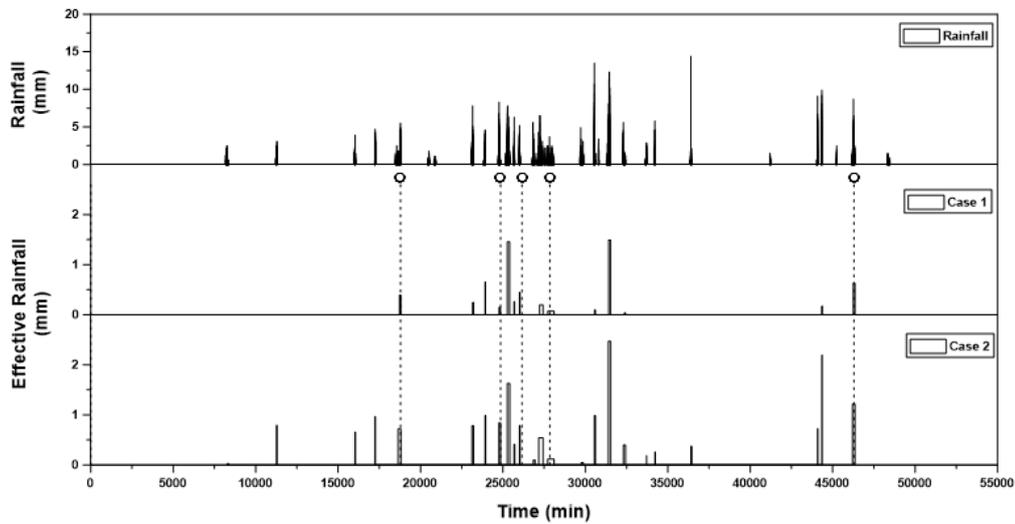
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ABSTRACT

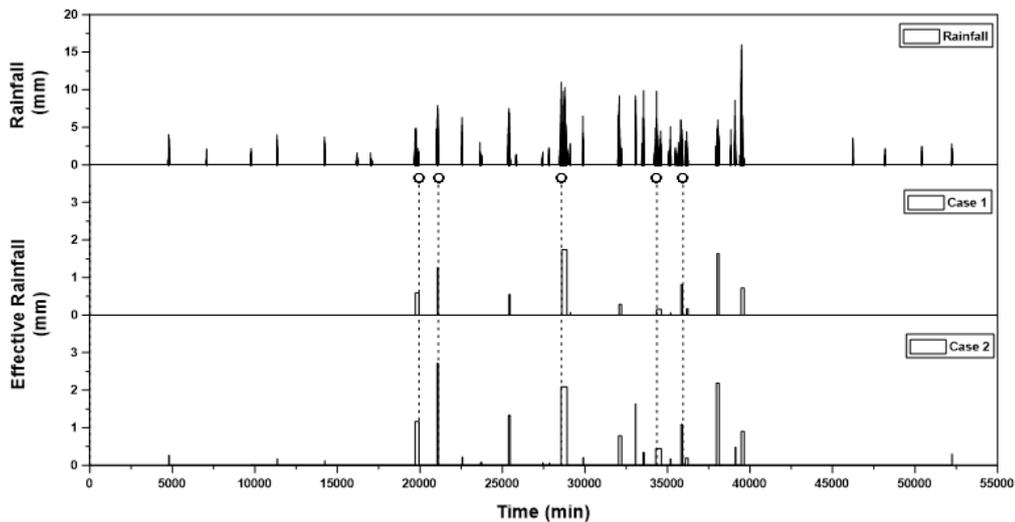
This study tries to validate an infiltration model, the Soil Conservation Service–Curve Number (SCS–CN) method, using the nonofficial intermittent occurrence data of Eongtto Falls on the volcanic Jeju Island, Korea. Simply due to the limit of official continuous runoff data in Jeju Island, the validation of a newly-set SCS-CN method for Jeju Island was practically impossible. Instead, this study tries to use the nonofficial data for this purpose. This study focuses on the intermittent occurrence of Eongtto Falls, which is one of the famous tourist attractions. Various records of the occurrence of Eongtto Falls can be collected from newspapers, personal homepages, and various social network services. The SCS-CN method is, in this study, used to check if the effective rainfall occurs or not. In fact, this approach is quite effective in Jeju Island as most streams are fully dry during non-rain period. Evaluation of the SCS-CN method is based on the analysis of a contingency table, which counts the consistency of the occurrence of effective rainfall events and waterfall records. Also, to quantify the results of the contingency table, some measures like accuracy, hit ratio, and false alarm ratio are used. This analysis is done with all the rainfall events from 2011 to 2019, and the derived results confirm that the newly-set SCS-CN method is far better than the conventional one used so far.

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(a) 2011



(b) 2019

Fig. 1 Comparison of estimated effective rainfall and the occurrence of Eongtto Fall in the years of 2011 and 2019 (the empty circle represents the time when the occurrence of waterfall was recorded)

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