

Interactive comment on “Coupling the modified SCS-CN and RUSLE models to simulate hydrological effects of restoring vegetation in the Loess Plateau of China” by G. Y. Gao et al.

Anonymous Referee #2

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General comments: In this manuscript, the modified SCS-CN and RUSLE models were coupled for predicting the event runoff and soil erosion. The objectives and relevant scientific questions addressed in this paper are within the scope of HESS. The scientific methods and assumptions are valid and clearly outlines, while the results are sufficient to support the interpretations and conclusions. Before it is accepted for publication, the following suggestions should be considered and some modifications should be done. 1. In the standard SCS-CN method, the initial abstraction ratio is assumed to be 0.2. But many researchers observed the initial abstraction ratio in the range of 0.0 to 0.3. For example, Mishra and Singh (1999) obtained values of the initial abstraction

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ratio ranging from 0.000 to 0.042 for three watersheds less than 1 km² in the USA and for one 3124 km² watershed located in India, respectively, while Huang et al (2007) optimized the initial abstraction ratio of 0.001 for four plots. The initial abstraction ratio represents the effects of soil and cover characteristics on the runoff process, and might not be a constant. In this manuscript, authors compared two initial abstraction ratios of 0.2 and 0.05, and found that the modified SCS-CN model with the initial abstraction ratio of 0.05 could improve model precision. The reviewer suggests that authors should consider to optimize the initial abstraction ratio using the measured rainfall-runoff data, and to obtain a reasonable value for the studied plots. 2. In Table 1, authors should provide the standard value of CN₂ for each group. 3. The statistical characteristics of rainfall for the simulated runoff events are very helpful for readers to understand your simulations. Reviewer suggests that authors should add them in manuscript. 4. The DISCUSSION section is very limited in this manuscript. Some results, such as the simulated efficiency, should be compared with other researchers using the SCS-CN method.

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