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Hydrology and Earth System Sciences Discussions

Interactive comment on "Research on the initial abstraction – storage ratio and its effect on hydrograph simulation at a watershed in Greece" *by* E. A. Baltas et al.

Anonymous Referee #2

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This paper illustrates an application of the Soil Conservation Service (SCS) method to a small watershed in Greece. The study shows that better hydrograph estimates can be obtained if the ratio between "initial abstraction" and "watershed storage" (I/S) is estimated from the data, instead of being assumed equal to the empirical constant fixed by the SCS method. This improvement is seen in both the absolute error and the timing of the peak flow. Moreover, it is shown that I/S varies depending on the rainfall event and with the physical characteristics of the watershed. The latter is demonstrated by the different I/S ratio found at a northern subwatershed with different geological features.

The paper is very clear and well written. The geological features of the watershed are described in details.

Even if the paper specifically focuses on the I/S ratio, its findings can be considered in a broader perspective. In fact, this paper brings the attention to the fact that the nature of the SCS equation is empirical and some of the assumptions of this method may be too general and not applicable to all watersheds and conditions. A similar concern was also expressed by Michel et al. (2005), referenced below.

I think that the topic of this paper has some general relevance and can be of interest for many readers, which are using the SCS method, and therefore the paper should be published in this journal. On the other side, I agree with the Referee #1 that this paper, as it is written, focuses on a too specific application of the SCS method. The way the results and the conclusion are presented also lacks of generality. Therefore, I suggest to accept the paper for publication, after major changes have been done.

My opinion is that, in order to insert the work in a broader perspective, the paper should be restructured as follow. The scope of the paper should be presented as a trial to improve the existing SCS method, rather than focusing on a very specific application of the method and its findings. I also suggest that the limitations of the method and the previous work done using this technique, which are introduced in section 3.2.2, are moved to the introduction. In the final conclusions more general conclusions on the applicability of the SCS equation should be drawn. The possibility to generalize and to extend to other case studies the specific results found in this work should also be discussed.

Technical corrections:

The full name of the SCS method, i.e. Soil Conservation Service, should be reported at least once in the paper, when it is first introduced in the abstract or in the Introduction (page 2170, line 23)

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The notation should be consistent in the equations and in the text (for example, compare how the index of Pe, the total excess rainfall, appears in: page 2174, lines 10, 19, 22 and eq. (1)).

Page 2171, line 14: “The estimated by...” should be: “The estimate by...”

Reference

Michel, C., V. Andréassian, and C. Perrin (2005), Soil Conservation Service Curve Number method: How to mend a wrong soil moisture accounting procedure?, Water Resour. Res., 41, W02011, doi:10.1029/2004WR003191.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 2169, 2007.