

Interactive comment on “Forest cover influence on flood assessment in Italian catchments” by F. Preti et al.

Anonymous Referee #1

Received and published: 17 June 2011

General comments

The paper analyses the influence of forest cover on flood peak for 75 Mediterranean catchments in Italy. The authors proposed a correction for the runoff coefficient estimate which accounts for the effect of forest cover. This appears to be the main point of the paper and I believe the method used is justified. The paper is well written, methods and results are adequately presented, however, it is regrettable that no discussion of the interesting results was presented. Consequently, the interpretation of the results is weak, and the originality of the study is not sufficiently highlighted.

For these reasons, I recommend major revisions for this paper before its acceptance in HESS. Below I list my suggestions for this paper.

C2244

Specific comments

Title

I suggest that the term 'Mediterranean' should appear in the title, maybe instead of (or in addition to) 'Italian'.

1 Introduction

I suggest that authors add additional international references from Mediterranean hydrology in order to better justify the need to improve the knowledge of forest influence on catchment hydrology in this context (all catchments used in this study are located in a Mediterranean context).

The originality of the paper is the modification of an estimate of annual flood peak by adding a loss factor as a function of forest fraction. Thus, readers need a reference or a justification of the use of the Eq.1 as a reference of QT estimate for ungauged basins.

2 Study catchments

For more readability, Eqs. 2 & 3 should be presented in the same section than Eq. 1. What is the validity of the CL and Cobs variables? Give more details on the assessment of such parameters. Since the data processing is based on these variables, it would be interesting to give absolute values of CL and Cobs in Table 1.

3 Data mining

At the beginning of this section, I would expect a short explanation of the choice of statistical method (Spearman ranking and cluster analysis).

p 4898 L 3-4: it is not clear enough that Y variable groups all variables listed on p 4896: A, Zm, tc, etc.

p 4898 L 12 to L24: Please add the following reference when detailing the silhouette method (and simplify the explanation in the text): Rousseeuw, P.J., 1987. Silhouettes:

C2245

a graphical aid to the interpretation and validation of cluster analysis, *Journal of Computational and Applied Mathematics* 20:53–65.

p 4899 L 17: Table 8 is not referenced in the text

p 4900 L 13: justify why it is expected

p 4899 L 23 to p4900 L 20: only R^2 is discussed while SSE, $\text{adj}R^2$ and RMSE are calculated. Please comment on all criteria or remove them.

4 A new conceptual model

p 4901 Eq. 6: criteria in Eq. 6 (ME, MAE) are not the same than in Table 10 (Bias, Abias). Please, clarify. RMSE should be defined in the text when it is used for the first time (p 4899 L 27)

p 4901 L 12: the storage capacity of forest soil is one explanation among others, but I think that considering the data set they used, authors cannot differentiate soil storage from canopy storage or interception losses. It should be discussed here or in a separate section.

I think that a general discussion of the results is missing.

References

The authors should review the references section in order to add references made in text but not present in the references list (e.g. Bathurst et al., 2011; Lewis et al., 2010).

p 4904 L 31: some author names are not written correctly: Andreassian, V. (and not Vasken, A.), and Richard D. (not Didier R.). Check in all reference list.

Tables & figures

The use of CL as runoff coefficient from the lithology and the use of CL1, CL2, etc. as clusters 1, 2, etc. is confusing, notably in Tables and in Figure 8.

I suggest to simplify Tables 4, 5, 6 & 7, merging Tables 4 with Table 6, and Tables 5

C2246

with Table 7. Another option is to consider a graphical representation of all variables for each selected cluster (using boxplots?).

Table 9: Tau is not defined in the caption. A separation line is missing between L_{rinf} and L_{rsup} .

Figure 3: I suggest adding units directly on the graph.

Figure 4: Labels are too small. Moreover, I would prefer contour maps presenting S_b and ΔC in X and Y, and hydro-morphological variables in Z. It would be better for comparisons between plots.

Technical corrections

P4898 L 3: among terms

p4900 L 3: (iii)

Caption of Figure 6, L4: (iii)

Caption of Figure 6, L5: parameters

Interactive comment on *Hydrol. Earth Syst. Sci. Discuss.*, 8, 4891, 2011.

C2247