

Interactive comment on “Modelling dominant runoff production processes at the micro-scale – a GIS-based and a statistical approach” by C. Müller et al.

Anonymous Referee #1

Received and published: 8 August 2008

In this paper, the authors propose two procedures for mapping presumable dominant runoff generation processes (DRP) based on the approach established by Scherer & Naef (2003). Further, they apply these procedures to a small research basin and verify their validity by comparing the obtained maps with the one obtained with the original approach.

General comments.

In fact, methods and style in the manuscript belong to the soil science scientific field, as the original paper by Scherer & Naef (2003) does. So, the DRPs (in that original paper) are assumed from soil properties like presence of signs of water stagnation or

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



abundance of macropores, whereas the reference process observations (again in the original paper) are rainfall simulation experiment results at the plot scale. In my opinion, this should not be a major inconvenience for publication in HESS, provided the authors realise (and revise the whole paper taking into account) that the major audience will belong to the hydrological sciences community, where methods are more based on quantities than on features, results are typically hydrographs rather than maps, and some common soil science terms may be incomprehensible.

The other major aspect of the paper is its complete subordination to the original Scherer & Naef (2003) approach, both in terms of method and reference truth. No observations on hydrological processes or soil features are reported, and the validity of the DRPs obtained with the original method is not discussed. Crudely speaking, the main purpose of the work is to obtain simple GIS methods which use easily available information for obtaining DRP maps that mimic those obtained with the original method which needs time-consuming field work. Although the authors claim to be successful, they should consider that this is a 'calibration' exercise, so they did not verify the validity of their approaches in a new area (with diverging climate and physiography) where their approaches and the reference one would be independently applied: it seems to me that the new methods might be useful for relaxing the density but not substituting the field observations needed to obtain DRP maps. Yet, the results are compared with those obtained with another indirect approach, but not with observed (or simulated with another kind of method) hydrological processes, so the question on the validity and usefulness of these DRP maps remains open.

Minor comments (specific and technical)

- The title is not adequate as 'model&' has currently another kind of meaning in Hydrology. 'Mapping' would be a welcome term.
- In the abstract, it should be stated that the 'existing DRP map' was made on the basis of an intensive survey of soil properties (but not on the hydrological responses).

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



- The list of DRP in the introduction (lines 6-11 in page 1679) should be moved to the methods section.
- 'Gleying' (line 1 on page 1681) should be substituted by water stagnation or a similar term.
- explain or substitute the term 'meliorated' in line 4, page 1681 (drained?).
- Approach 1: it is unclear if this approach was independently developed or if the available DRP map was used to 'calibrated' it.
- In line 19, page 1683 it is not stated that S and LS factors were USLE factors, as reported later (page 1986). Please, refer which kind of algorithm you used for obtaining these factors.
- The comparison of the results with the available DRP map is unbalanced, as Approach 1 is compared using maps whereas Approach 2 is compared through tables. Both types of comparison should be made for both approaches.
- The written comparison between approach 2 and the available DRP map (page 1687) is too long; avoid repetition of data shown in tables.
- Conclusions: It is unclear that the first approach may be an alternative to the field campaigns in any other areas, as it will presumably depend on climatic and physiographic characteristics; the new approaches might presumably be useful for relaxing the density of the field observations to build DRP maps. Some kind of true hydrological validation of the DRP maps should be needed before its use for hydrological modelling (or this modelling might be used to verify its utility).
- Table 3 does not correspond to the citation in the text.
- Tables 4 and 5 are superfluous.
- Use uniform units on table 6 (ha or %).

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



- Figure 2b is not adequate: the graph does not depict the logics of the procedure, as the permeability of the substratum determines the set of functions used. Erase 'field mapping Zemmer' box.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 1677, 2008.

HESD

5, S893–S896, 2008

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

S896

