

Interactive comment on “A structure generator for modelling the initial sediment distribution of an artificial hydrologic catchment” by T. Maurer et al.

Anonymous Referee #2

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In this paper the authors developed a geological model describing the sediment body of an artificial catchment of about 6 ha. Because this is a unique catchment the whole modelling effort is singular and therefore difficult to compare to other papers. Detailed knowledge concerning the construction of the catchment is used to develop a conceptual model which is further developed into a numerical model using a number of assumptions. Even though the general approach is interesting no one will be able to use the resulting model again because of its uniqueness.

General comments:

The paper is written well. Nevertheless, I found it difficult to extract the message from all the technical details. I wonder what is really required to understand what has been

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done. I would recommend reducing the length of the paper significantly by focussing on those details helping to understand the approach and the results. Although uncertainties and errors are partly addressed, I am missing some conclusions concerning this aspect. As far as I now two lateral clay walls have been created in the lower part of the catchment (see also Fig. 2D and Fig. 9B). Maybe I overlooked that but I did not find any information on that.

Introduction:

I wonder why all the papers have been cited. Many of them are just mentioned without showing what they found and why that is important in the context given here. Others are standard text books (Brutsaert) which replicate basic knowledge. Reduce that part drastically to those papers which really contribute to the topic given here.

Material and Methods:

This is a rather long chapter which too many details.

p 4657 | 19-26: Information are provided which are not required here (gully net work, vegetation) and which are based on information described later (denser vegetation on the more loamy part. . .)

p 4648 | 24: The link to Fig. 4a must be wrong but I do not see a figure in which that is clearly shown.

p 4652 | 1: Here and later on very often the term “pre-defined” is used. I wonder what that means. Are those parameters (Tab. 4) measured or based on measurements or are they estimated or artificial fixed? How sensitive are these parameters for the results?

p 4650 | 11-22 I wonder how important these information are. Fig. 4 is of poor quality (overloaded, no measuring stick, etc.). I found that part and Fig. 4 superfluous.

p 4653 and p 4654: are all those equations required? I would reduce that to that

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part necessary to understand the scientific idea. Details can be shown in a technical document.

p 4654 | 13: I wonder why the order of figures is Fig. 7, Fig. 10, Fig. 8. Please check that

p 4660 / 4661: How does the aggregation influence the results? What was the reason to chose $Da = 7$ (and not eg. 6 or 10) and how does that influence structures, volumes and properties?

p 4661 | 20 -22: How has the DEM been enhanced? A link to an unpublished report in German (Schneider et al. 2009) may not be enough

Specific comments:

References:

A number of publications cited are grey literature and not available or difficult to get. Please check if all of them are necessary, if they are available online etc. Examples: Barbour et al. 2004, Maurer et al. 2008, Maurer et al. 2009, Miller et al. 2008, Schneider et al. 2009, Zaplata et al. 2009, and others

Gerwin et al. 2011. Because this article is available online please provide www address

p 4676 | 31: Ronoff or Runoff ?

Table 1: Please explain what SFB/TRR is (the same for Table 2()) because it is only mentioned in the acknowledgements. Either delete "Saga GIS" or explain that

Table 5: What does -06/1.4 and -3.5/6.3 mean? If you do not know the volume after construction (left column) how can you calculate the difference (right column)?

Fig. 2 (and others): Size of letters much too low, difficult to read

Fig. 3: I found that figure very difficult. Maybe the figure is too small. What can be seen here? Explain "1", "2", "3", "4". Provide a measuring stick etc.

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Fig. 4: Overloaded with information, no measuring stick etc., not required

Fig. 7: I found that figure not necessary

Fig. 8: As before, not necessary

Fig. 9 A: Quality is poor, what does that mean “boreholes as spheres”? Is the complete area in the lower part full of boreholes or why is that coloured?

Fig. 13 F: You mentioned “Spatial patterns of generated structural heterogeneity are similar to those observed in reality (Fig. 13c, f)” Because I do not see too much similarity (quality is poor, figures are much too small) I wonder how that has been measured or is it just a visual comparison with the impression of similarity?

Fig. 14: Explain “A1/2”, B1/2”, “C1/2”

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