Interactive comment on "From maps to movies: high resolution time-varying sensitivity analysis for spatially distributed watershed models" *by* J. D. Herman et al.

Anonymous Referee #2

Received and published: 14 October 2013

This publication presents the results of a spatially distributed sensitivity analysis using different spatial scales: (1) 6-month period, (2) three events and (3) a daily scale using always a 3h timestep. The results show that the aggregation into larger scales produces a loss of information and that the dynamics of the system can be appreciated using a high-resolution analysis. It is also shown how the sensitivities vary spatially depending on the precipitation patterns of individual events. The moving time window enables a clear identification of shifts in processes. It was clearly stated, that a posteriori selection of representative events based on the results of the continuous sensitivity analysis provides more concise results than a priori defined event analysis. The fig-

ures are informative and support the text significantly. The combined graphics with joint temporal and spatial distribution of rain depths or sensitivity metrics look nice.

This is an interesting paper and I only have few minor comments and suggestions.

P10779_L24: Not everybody will be familiar with the details of the SAC-SMA model. Table 1 refers to some withdrawal rate parameters. Are these parameters constants or (non)linearly dependant to any state variable?

P10780: It is mentioned that the analysis will be done for the three events and using a high resolution window. It should be also said that the average sensitivities for the 6 month period will be shown.

Chapter 4.1 named "Event-scale sensitivity analysis" shows the results for the whole period besides the results for the three events. If the whole period is also considered to be "event scale", then this should be explained somewhere.

P10787_L4: In "...this measure of performance succeeds in activating a larger spatial area of the model...", it would be better to speak of "...succeeds in extracting information from a larger spatial area...".

P10787_L10: "... will cause a similar concentration of sensitivity ..." is not clear

P10787_L11: "... whereas distributed precipitation ...", maybe " ... homogeneously or uniformly distributed ..." would be better ?

P10787_L19: ".. the sensitivities shown in Fig 4 and 5 are strongly influenced by a few large events." refers probably only to the first row of plots, since the plots in rows 2 and 3 show the results for single events.

P10790_L16: "The parameters ... play a small role in model performance, but they are dominated by the upper and lower zone parameters ... " is not clear.

Table 1: Having information about the units for all parameters would be helpful. Please check the parameter values for the 4 parameters in which the unit is %. For example,

is the upper bound for the riparian vegetated area 0.2% or 20% ?

Fig 4 and 5: Consider changing the title of the plots "Event-scale sensitivity" if the full period is not considered to be at the "event-scale".

The movies are nice! Since the word "movies" appears in the title it could be a good idea to add 1-2 sentences about their existence in the text.