

Interactive comment on “A simple 2-D inundation model for incorporating flood damage in urban drainage planning” by A. Pathirana et al.

Anonymous Referee #2

Received and published: 28 May 2009

This paper presents a simple 2D inundation model to enable fast calculation of 2D overland flow for flood damage calculations. This is an important and active area of research given expected increased levels of flooding due to climate change and further densification of urban areas. The authors state they developed a model for simple and quick prediction of flood within an acceptable time limit to be used in planning stages of urban drainage projects. Yet in their paper, the authors fail to address issues related to application in practice, such as calculation time compared to existing 2D-overland flow models, accuracy of the developed model and added value for practical applications compared to existing models. Their focus is mostly on the theoretical background and technical details of the developed model, which for a large part is using

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

existing knowledge. By doing so, the authors do not demonstrate clearly what is original or new in their approach. There are several other comments I would like to make with respect to the paper content and equations: 1) As explained above, the title and abstract do not correctly reflect the subject of the paper, since relevance for practical application in urban drainage planning is not demonstrated; 2) There is no need to elaborate on equations and derivations if they can be found in the literature; it seems that citing of a proper reference would be sufficient, e.g. for the first 10 equations; 3) There seems to be an error in formulas nr 12 and 13 and following formulas that are derived from these: S_x and S_y should be multiplied by Δt ; 4) The way model coupling is implemented is explained only briefly: it seems coupling works only one way, from 1D to 2D model; what about the influence of water levels above manholes on the 1D flow and what about nodes that receive water from both overflowing manhole and upstream node; how does the model handle this? 5) Mass conservation is only checked globally and mass balance errors are in the order of several percentages; the authors should discuss how these errors influence the model results and if achieved accuracy is sufficient for practical application, under what conditions. 6) In paragraph 5.2 the authors state that the model performs well on an irregular topography; they should motivate this statement by referring to model results and make clear how results are evaluated. 7) A flood damage curve is introduced, but the results are not presented. In paragraph 5.2 the authors refer to some text file that contains monetary values, but the file is not presented in the paper. As such, the value of the developed model for practical application remains unclear.

Comments on figures: References in the text to figures are often incorrect: e.g. figure 3 on page 3075 seems to refer to figure 4 instead. Reference to figures 4,5,6 on page 3076 seems to be incorrect. There is no reference to figures 8, 9 and 10. Reference to figure 11 on page 3077 seems to be incorrect. Figure captions and legends should be extended for better understanding of what figures mean to illustrate. Comments on use of English: there are quite a number of grammatical and typing errors in the text that need to be corrected.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



In conclusion, it is not clear how this paper adds to existing knowledge and flood modeling tools in urban drainage. If the authors wanted to demonstrate that their model fills a void, as stated in the conclusions, they should really show how their model achieves useful results at an intermediate level of speed and complexity compared to existing models.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 3061, 2008.

HESSD

5, S2738–S2740, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

S2740

