

## ***Interactive comment on “Dynamic mapping of flood boundaries: current possibilities offered by Earth Observation System and Cellular Automata” by A. Gerardi et al.***

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Review of the paper 'Dynamic mapping of flood boundaries: current possibilities offered by Earth Observation System and Cellular Automata

This is a timely topic and the paper, if published, should be of interest to a large number of people with an interest in flooding.

The paper is generally well written but the structure needs improving; also, there are a number of points that need to be very carefully addressed before the paper is acceptable, if at all.

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- Abstract: needs to be re-written. At the moment this reads as an introduction and not a summary of the work/findings

- Introduction: This is too short and again very general. It only describes what the models do but does not at all provide background knowledge, a brief lit. review identifying the need for the presented study and motivation. I also suggested merging it with section 2.

- section 2: This section should definitely also include a description of current efficient 2D flood models (such as LISFLOOD-FP) and highlight the advantages/limitations of CEASAR that would help justify the choice of this model here.

- section 4: There is also now CEASAR-LISFLOOD-FP. This should be mentioned here (see reference below). I do not agree with the rather simplistic formulation that TOPMODEL does full flow propagation. It is not a hydrodynamic model at all. It is based on a rather simplistic routing compared to hydraulic models.

Integrating the LISFLOOD-FP 2D hydrodynamic model with the CAESAR model: implications for modelling landscape evolution, Tom J. Coulthard, Jeff C. Neal, Paul D. Bates, Jorge Ramirez, Gustavo A. M. de Almeida and Greg R. Hancock, 2013, DOI: 10.1002/esp.3478

- section 5:

What does 'the results were satisfactory' mean? You need to show some sort of quantification here.

The results are here merely a qualitative description of the processes, not a numerical quantification. This is missing and needs to be included.

Also, in a couple of places, language requires revision

- section 6:

These 3 so-called new functionalities are not really new since all three should 'always'

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be part of any modeling exercise.

- section 7:

The objectives should definitely be upfront, not after 2/3 of the paper

- section 8:

Some of these statements at the beginning about SAR are far too simplistic and some are not entirely correct (illumination?, etc). This part needs serious revision

I think the SAR processing should be done automatically, especially if the authors can do image differencing. A very easy to use approach has been introduced by Matgen et al (2011) for C band SAR data and their code is available as a Matlab script for free (if I recall correctly).

P. Matgen, R. Hostache, L. Pfister, L. Hoffmann, G. Schumann, P. Bally and H.H.G. Savenije, 2011. Towards an automated SAR-based flood monitoring system: lessons learned from two case studies. *Physics and Chemistry of the Earth*, 36, 241-252.

- Conclusions:

This section should be revised after the concerns raised above have been addressed. At the moment this section just recaptures some very general statements about CEASAR rather than concluding on the results of this study.

- Figures:

Some of the figures do not show anything significant and I suggest to remove those (figs 5 and 6)

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 833, 2014.