Hydrol. Earth Syst. Sci. Discuss.

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Title: Inundation mapping based on reach-scale effective geometry

General comments

The authors made a valiant effort to answer the major concerns I had raised in my first review of the paper. I have gone through all their answers to my specific comments and editorial comments and I am generally satisfied.

In the end, the paper introduces the development of a novel conceptual inundation mapping procedure based on the well-known DEM-based HAND concept and standard hydraulic geometry functions coupled with 1-D steady-state flow equations. The sensitivity and uncertainty analysis represents a nice addition to the paper, providing useful information for future application of the inundation mapping methodology. A major event in France was used to provide a calibration case study.

That being mentioned, the authors should provide a discussion on the fact that a DEM model of a river network does not always provide the geodesic elevation of the river bed. I did not see that discussion in the paper anywhere!

At this point, I recommend minor revision based on the specific comments and editorial suggestions listed below. Once these are addressed by the authors, I believe the paper will be of interest to readers of *Hydrology and Earth Systems Sciences*.

Specific comments

P.2, L.7 Please complete the following: (*e.g.*, ?)

P.18, L4 Please insert bibliographical references after Morris and Sobol.

P.19 The authors state: « …it is also the easiest, because it is easily feasible to compute a relationship between widths derived from satellite images of the river and drainage areas, which does not need any calibration. »

> I disagree. It is difficult to assess the bankfull width of a channel using solely satellite derived data. To my knowledge, any relationship derived using the latter approach requires calibration with *in situ* bathymetric data. The authors should not oversimplify reality because it suits their argument well! Be frank; that is the least the authors can do.

P.27 Please delete Zheng *et al*. (2017).

Fig. 1 Please in frames (c) and (d), all the cells of the top row (those with a drainage area of 1) should be in pink according to the flow direction matrix displayed in frame (b). Please verify carefully this figure.

Fig. 9 Insert in the caption add to the figure: (a) Bias contour lines and (b) CSI contour lines for various values of K_{fp} and K_{ch}.

Fig. 10 The caption is incomplete; (a) and (b) must be defined

Fig. 11 Please modify the figure caption as follows: Cumulative frequency of CSI and Bias values

Fig. 12 Please define in the figure caption the identified locations 1 through 4. Also, identify each map in the caption as well (*e.g.*: (a) Bias, (b) CSI). Moreover, each time a location is discussed in the text, remind the reader of the Figure associated with the region. Moreover, each time a location is discussed in the text, remind the reader of the Figure associated with the region.

Fig. 13 Please define in the figure caption the identified locations 5 through 7. Also, identify each map in the caption as well (*e.g.*: (a) Bias, (b) CSI). Moreover, each time a location is discussed in the text, remind the reader of the Figure associated with the region.

Fig. 14 Please define in the figure caption the identified locations 9 through 11. Also, identify each map in the caption as well (*e.g.*: (a) Bias, (b) CSI). Moreover, each time a location is discussed in the text, remind the reader of the Figure associated with the region.

Fig. 15 Each contour map should be labeled (a) 10m through (d) 100 m in the figure and defined in the caption.

Fig. 16 Identify each map in the figure and in the caption (*e.g.*: (a) Bias, (b) CSI).