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Hydrology and Earth System Sciences Discussions

Interactive comment on "Estimating flooded area and mean water level using active and passive microwaves: the example of Paraná River Delta floodplain" *by* M. Salvia et al.

Anonymous Referee #1

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GENERAL COMMENTS

This manuscript presents a methodology to estimate the flood extent and mean water level in the Parana River flood plain by using synergistically active and passive microwave remote sensing data, plus emission simulation models. The paper clearly falls within the scope of HESS, since it addresses the spatial and temporal monitoring of the water amount present in a wetland area.

The manuscript is well structured and written in a clear, precise and fluent English. A suitable number of figures illustrate the analysis steps undertaken throughout the text.

The paper combines the use of passive (AMSR-E) and active (Envisat ASAR) microwave data time series together with radiative transfer modeling, which is quite unusual and innovative. The presented method exploits an existing radiometric polarization difference model and a simulation model of vegetation emissivity. It also makes use of ancillary data regarding the spatial distribution and morphological features of the vegetation. All the previously developed work is properly referenced. The methodology is applied to estimate the mean water level evolution in the study site using three AMSR-E frequencies. The results for the three frequencies show good agreement.

SPECIFIC COMMENTS

Page 2896, lines 10 to 18: In the first paragraph of the Introduction section, the author states that the microwave-based flood monitoring methodologies are often used and successful. It would be appropriate, in the opinion of this reviewer, to include one or more references supporting this assertion.

The reviewer misses some discussion on the accuracy achievable by the method in the water level retrievals, or further comparisons with ground truth data: were there more gauging stations during the time period analyzed? Maybe a topographic map would allow to roughly assess the relation among fraction of flooded area and changes in mean water level.

The thresholding of ASAR data for the flooded fraction estimate seems a potential source of significant error: soil moisture, for example, could increase the backscattering coefficient more than 1.5 dB. Furthermore, an increase in soil moisture could affect large areas and therefore introduce considerable error in the flooded fraction estimates.

TECHNICAL CORRECTIONS

Page 2900, line 3: "Del Plata" estuary should be "De La Plata" estuary (I think...).

Page 2902, line 24: "Envisat ASAR precision image products in Wide Swath image mode" should be "Envisat ASAR medium resolution image products in Wide Swath

image mode".

Page 2909, line 11: "Table 2" should be "Table 3".

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