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Discussions
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Interactive comment on "Observing river stages using unmanned aerial vehicles" *by* T. Niedzielski et al.

Anonymous Referee #1

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This paper is about mapping water surface areas reflecting different river stages using a simple UAV. The authors use the standard "Structure from Motion" method, however, without ground control points, and declare that the accuracy of mapping is sufficient to catch differences in the spatial extent of the river water levels due to a sufficiently high internal accuracy of the resulting orthophotomaps. The results indeed seem to be reasonable and supported by a statistical analysis, however, the paper needs to be more clearly written, some parts and methodological aspects are rather poorly explained.

Here are my suggestions:

- Please specify if all flight missions have been carried out using the same parameters, especially flight heights having the impact on the ortophotomap resolution and thus the accuracy of mapping

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- Please explain in detail how you used the LIDAR data to do "a spatial fix and correct for errors". I think the statement that you have used the "spline function in ArcMap" is not sufficient. This part needs to be written more clearly what you have done here

- p. 2, l. 26, "high-resolution visual" is probably "high-resolution visible"

- on p. 6, l. 27-31 you have presented the criteria that should be met by the polygon generation procedure. As far as I have understood correctly, you have used a manual digitalization/vectorization of the water extent. Has this procedure met these criteria? Is the accuracy acceptable to catch relatively small variations in the extent of water surface?

- p. 6, l 15, explain "GSPs" abbreviation, probably a typo

- p. 9, l 3-7, please describe why you expect that water surface area at the time k will be greater than at the time j. Figure 6 clearly shows that water levels (A)-(E) are not increasing in time. This needs to be better explained because it is centred in the core of your paper with implications for your conclusions.

- on p. 10, l. 10-20 you have presented several transitions between stages. However, this part is very poorly explained. For example, how it is possible to have a subsequent stage (13/05/2013) after a later stage (02/06/2014).

- I recommend to present a Table with areas of the identified polygons representing identified water extents (equivalent to Figure 8). Some polygons seem to be almost identical and it is difficult to visually identify if it is larger or smaller.

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