Natural Hazards and Earth System Sciences Discussions

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2022-63

Anonymous Referee #2

Referee comment on "Effectiveness of Sentinel-1 and Sentinel-2 for flood detection assessment in Europe" by Angelica Tarpanelli et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2022-63-RC2, 2022

Tarpanelli et al., address an important question in the submitted manuscript, namely the suitability of the Sentinel 1/2 Satellites for flood inundation mapping in Europe. Through synthetic assessments based on discharge values to detect flood events, the authors simulate the satellite coverages and calculate the probability of capturing inundation events through the Sentinel-1 Synthetic Aperture Radar sensor and the Sentinel-2 optical sensor. The study also tests the findings from the synthetic study for three real world flood events and find most of their conclusions supported through this analysis. In principle the paper is well written, easy to follow, and of interest to the larger flood mapping community in Europe. I only have some minor comments as summarized below, which I believe will help improve the quality of the manuscript.

- Referencing: the introduction cites papers from over a decade ago to establish current flood impacts and scientific advances. Given the rapidly evolving body of literature in this topic, I think this should be improved as newer publications are sometimes tackling the newer challenges in the field which arose out of the rise of big data and machine learning. I have provided some reference suggestions, but the authors are welcome to seek out some more. I also found some references cited wrongly – e.g. Clement et al. 2018 is cited for the extraction of inundation water levels which they did not actually do in the paper. The authors should check such oversights in the referencing throughout and correct these before publication.
- Recent relevant developments: For a study looking to assess the suitability of the Sentinels for flood monitoring in Europe, the paper misses two very important and relevant new developments. These are namely, the launch of the Global Flood Monitoring Service from the Copernicus Emergency Management Services and the failure of Sentinel-1b. While it might not be possible to account for the latter in the analysis at this time without needing to reproduce the figures, I think it is still relevant to acknowledge this issue either in the introduction or in the discussion/conclusions and the potential impact this has on the conclusions of this study.
- Relationship between discharge and inundation: The authors assume that the discharge peaks represent the inundation peaks as well, this is not true in most cases due to the lag between the channel and floodplain peaks, as well as the highly non-linear

relationship between discharge and inundation. Again, I do not think there is any need to alter the analysis, however, it would be nice to have the authors acknowledge this point while stating their assumptions and then assess the potential impact this may have on their conclusions in the discussion section.

Technical corrections are very few and included in the reviewed PDF file. On incorporating these minor comments, I think this article would form a valuable addition to the published literature in this direction. I look forward to seeing the final version online and thank the authors for their time and efforts.

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2022-63/nhess-2022-63-RC2-supplement.pdf