

## ***Interactive comment on “Low cost, multiscale and multi-sensor application for flooded areas mapping” by Daniele Giordan et al.***

**Anonymous Referee #1**

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The manuscript includes an original study on flood mapping using various remote sensing image sources and techniques. Therefore it has practical significance. In the literature, as also referenced in the study, there are so many research articles studying the evaluated data types and the techniques, however this study uses most of the available data sources and techniques for a single case showing the efficiency of results. Therefore, a comparative study in which the results of maps using optical and SAR images processed with different remote sensing techniques is presented. In general, the proposed approach was explained well, the experiments were conducted properly, and the results were discussed in the manuscript. However, there still exists some missing points in the manuscript in terms of the completeness of the paper. Therefore, if they are corrected considering the minor issues highlighted below, the article is

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recommendable for publication.

Reviewer recommends: # In section 3.1.1 - It is noted that available COSMO-SkyMed image has been classified into three main land cover classes as; water-covered areas, i.e., flooded (low amplitude), urban areas (high amplitude) and soil/vegetation (intermediate amplitude). There, what is the type of the classification method used? The result of the accuracy assessment of the classification process was not given? Authors are recommended to give at least the overall accuracy of the classification! Please also note that in section 4.1.1, the classification accuracy of COSMO-SkyMed was not presented. # In Section 3.1.2 - Did the authors apply an atmospheric correction to MODIS data? - It was also noted that a supervised classification was applied to MODIS by SAGA-GIS. Which supervised classification method was used? Quantify the accuracy of the classification result. # In Section 3.2.1 and 3.2.2 - DSM is generated from high resolution images. Digital Surface Model (DSM) is not a Digital Terrain Model (DTM). Authors should know the difference between surface and terrain model. # In section 3.3 - How did the authors perform water level measurements by GPS-RTK positioning? Give a little detail. # In section 4.1.2 - In Figure 4, in the figure caption, the letter of the final item D) appears as C) second time! Correct it. - It is observed that MODIS image is classified into Cloud, Water, Wet soil, Vegetation, and Bare soil whereas COSMO-SkyMed image has been classified into three main land cover classes as water-covered areas (i.e., flooded), urban areas, and soil/vegetation. It looks like only a GIS query can be done between the classes "Water" and "Water-covered areas" classes derived from CSKM and MODIS images, respectively. Authors need to explain in detail how they used maps generated from the classified images. # In Section 4.2.3 - Authors declared that " During the post-processing, we realized that the quality of the images extracted from the video was insufficient for the SfM application. For this reason, after a month we performed a second survey along the same path" Explain the insufficient qualifications for the extracted images used for the SfM application. # In Section 5 - It was written that ..... " the combined used of InSAR data of Sentinel-1 and Cosmo, and multispectral data of MODIS-Aqua and Sentinel-2 allowed creating maps of the

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flooded area. InSAR data showed a good performance in the real time flood mapping while are weaker for post event mapping....." Here, instead of InSAR data, the use of SAR data is recommended. It is because the only amplitude value of the SAR data was used and no interferometric process was applied. # In the discussion and results section - Rather than using expressions such as "good agreement", "more precision", "good accuracy", etc; quantify the accuracy or the quality of maps, results, etc.

Last but not least, the difficulty of this study is that the satellite data might have not always been received at the time of the hazard occurred! The authors can add a better flowchart that shows the missing data can be replaced by the other, taking into account the image data sorted from high resolution to low resolution.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-420/nhess-2017-420-RC1-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2017-420>, 2017.