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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Effects of spatial resolution of terrain models on modelled discharge and soil loss in Oaxaca, Mexico" *by* Sergio Naranjo et al.

Carsten Marohn

marohn@uni-hohenheim.de

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Replies to reviewer

Dear Paolo, many thanks for your very constructive and helpful comments on our paper on all of which we agree and which we addressed as follows (see attached pdf manuscript file):

With respect to your general comment #3) You don't provide much literature on the UAV aspect. A very important point here is the use or not of ground control points (GCP) in the generation of DEM. What could happen without GCP is the bowl effect

which could inficiate the whole experiment. In your case, from a visual inspection of Figure 7a, you have not had this problem. Reply: We agree with your observation and added details about how we used GCP and on our PPK correction process, which we inserted, together with 3 references, before Figure 2: For both flight campaigns, high-accuracy corrections of the geolocation data measured with the UAV global navigation satellite system (GNSS) were calculated in the post-processing stage using the position of a fixed pre-established real-time kinematic (RTK) base station as a reference. Post-processing kinematic (PPK) correction was then implemented during imagery geotagging processing (Benassi et al., 2017; Forlani et al., 2018, Volpato et al., 2021).

Regarding the detailed comments in the attached supplements pdf file: Line 33: perhaps a list of acronyms at the beginning would help Reply: We have uploaded a list of abbreviations and added the missing explanation (1 Pg = 1bn Mg) in the text. The list comes as a separate file, but can be integrated in the main manuscript, if the editors agree. Line 38: perhaps some reference would be useful here. Reply: Many thanks for your suggestions, of which we added the ones by Batista et al. (2019) and Pandey et al. (2016). Line 43: a DTM is not a special case of DEM, it is a different product, or if you wish it is derived from DEM. But this depends on the technique used for data aquisition: if you use LiDAR DTM is directly derived from the filtering of the data, if you use sterophotography then you first generate DEM and then derive DTM I would suggest to remove this part of the sentence Reply: As suggested, we drop the part "a special case of a Digital Elevation Model (DEM)". Line 45: which publicly available DEM at 10 m with almost global coverage do you refer to? Both SRTM and ASTER DEMs, are offered at 1 arc-second spatial resolution that is on average equal to 30 m pixel size. Reply: True. This should have been 30 m and we changed it accordingly. Line 48: better to avoid 'etc' Reply: We replaced etc. with "among others" Line 50: only for the freely available ones. The commercial sat data reach o.3 of a meter in pixel size. Reply: This is probably a misunderstanding as "tenths of a meter" (not tens) and "0.3 meter" is not a contradiction. Lines 54f.: Reference/s is needed here Reply:

We added the paper “Resolution vs. image quality in pre-tsunami imagery used for tsunami impact models in Aceh, Indonesia” by Laso et al. 2015, where we discuss resolution in context with LULC images. Line 77 (caption Fig 1): the inset with the location of the study sites is not legible and should be presented at higher resolution. Also the labels not in bold are too small and not legible Reply: We have changed the font size and symbols accordingly. Line 81: as you have added few words explaining the Lepto- and Vertisols, for consistency would be good to add few words also here for the Luvisols Reply: We added: [Luvisols (INEGI, 2014)], “soils with Bt horizon of clay illuviation and relatively high base saturation”. Line 85: what is the meaning of this and the following acronyms? Reply: We added an explanation in the text: “Five soil erosion monitoring study units (SU) represented the four main land covers (Fig. 1): Forest (SUFO), [. . .]”; see also list of acronyms. Line 95: I would bring table A1 here in the text instead of relegating it in the Annexes Reply: We agree and moved the table here. Line 154: not cropped Reply: Changed accordingly. Line 156: 65 % lateral (sidelap?) and 75 % longitudinal (frontlap?) overlaps Reply: Yes, within low altitude imagery surveys lateral overlap means ‘sidelap’ and longitudinal overlap means ‘frontlap’. We chose to keep the nomenclature widely used throughout the literature and software (see references below) and added sidelap and frontlap in brackets for better understanding: https://www.frontiersin.org/articles/10.3389/fpls.2019.00552/full https://www.frontiersin.org/articles/10.3389/fpls.2021.591587/full https://www.stars-project.org/en/knowledgeportal/magazine/uav-technology/flight-planning/determining-flight-parameters/ Line 162 (caption Fig. 2): what is the meaning of the arrow in these images? Reply: We added “arrows indicate the main flow direction” to the caption. Line 193: what is the meaning of the * in each data input class? Reply: The asterisks are just bullet points in an unlucky format. We have changed them to conventional bullet points. Line 201: maybe a few words to explain what ROSETTA is would help the reader Reply: We agree and added: [...using Rosetta (Schaap et al., 1998)], a software to estimate soil hydraulic parameters [, which required. . .] Line 292: resampled Reply: We have added “resampled” as suggested to the caption of Fig 8.

We also updated formatting of the references section. With kind regards, Carsten Marohn on behalf of the authors

Please also note the supplement to this comment:
https://hess.copernicus.org/preprints/hess-2020-641/hess-2020-641-SC1-supplement.pdf

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