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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Flood Impacts on a Water Distribution Network" *by* Chiara Arrighi et al.

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On behalf of my co-authors I would like to thank the referee #1 for his comments and suggestions. In the revision and polishing phases the manuscript will be thoroughly checked by an English native speaker to improve readability. I am now giving a short reply to the specific comments, which will be addressed in more detail in the revised manuscript.

1) The flood model here adopted and described in Arrighi et al. (2013) is very parsimonious from the numerical point of view. However, it has been demonstrated to be good enough to model water depths in the urban area when compared to historical watermarks. Thus, for the purpose of the study, an acceptable estimation of the maximum flood depth is considered as appropriate to make a control on the pressures of the nodes of the network. This implies to be able to capture the elevation of the road

network by using high resolution LiDAR-derived digital terrain models. The size of the study domain and the need of a very high mesh resolution, e.g. of the order of 0.5 m to represent the streets/building pattern, would imply a few million cells to be simulated in a full 2D model, with consequent specific hardware requirements. The use of the parsimonious flood model is however not suggested for flat topographies where full 2D models are recommended.

2) The results section will be better organized to improve its structure.

3) A more detailed comparison with the direct damages described in previous works will be included considering monetary losses, affected population and cultural heritage in order to better communicate the global flood risk context of the study area.

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