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Interactive comment on "Modeling glacial lake outburst flood process chain: the case of Lake Palcacocha and Huaraz, Peru" *by* M. A. Somos-Valenzuela et al.

Anonymous Referee #2

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Modeling glacial lake outburst flood process chain: the case of Lake Palcacocha and Huaraz, Peru. Referee comments The paper describes multi-scenario modeling of glacial Lake Palcacocha outburst and inundation of Huaraz city. The parameters of the possible GLOF are evaluated on the base of the chain of several models. Such approach gave possibility to authors to carry out potential hazard mapping of Huaraz city, which due to its location is very vulnerable to mountain disasters. The paper is good structured; each part of modeling is described indetail and enough illustrated. This research is very important for the developing of mitigation measures according Lake Palcacocha possible GLOF.

Some small improvements could be done before publication: Abstract, line 8

and Study area,p.7 line 25. There are different estimations of number of victims during catastrophic GLOF in 1941 exist. For example, Mark Carey (Mark Carey, In the Shadow of Melting Glaciers: Climate Change and Andean Society, 2010, DOI:10.1093/acprof:oso/9780195396065.003.0002) wrote, that "glacial lake outburst flood in 1941 killed 5,000 people and destroyed one-third of the Ancash capital city of Huaraz". So, it is may be better to give several references in one place (for example, in the Study area description). P.8 Study area. As shown on the fig.1, there are several other river branches with lakes in the area above Huaraz city. Does any possibility of their outburst exist? Or Lake Palcacocha is only one potentially dangerous lake in the basin? It could be interesting to the reader. P. 14 Moraine erosion simulation. It is not rare case in the glaciated areas, when moraine dam contains ice or frozen patterns. In such case dam erosion process during outburst flood has other mechanism and erosion can be larger. Whether the damming moraine of Lake Palcacocha may contain ice? This point should be mentioned and discussed. P.18. Inundation simulation. FLO-2D model chosen for inundation simulation, doesn't take into account additional erosion and subsequent accumulation of debris during flood wave moving. However, there are several zones of erosion and accumulation of debris from 1941 GLOF along the Paria River, and the same additional erosion and accumulation could be expected for the next GLOF event. Such redeposition is very difficult take into account during modelling, but this model limitation should be mentioned. P.21 3.6 Hazard identification. To my opinion, it is better to use term "potential hazard" instead "hazard" for described hazard zonation. P.4 line 10 Fischer et al., 2012) –left parenthesis is missed

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/hess-2015-512/hess-2015-512-RC2-supplement.pdf