

## ***Interactive comment on “Reconstruction of the 1941 GLOF process chain at Lake Palcacocha (Cordillera Blanca, Perú)” by Martin Mergili et al.***

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The manuscript addresses a relevant problem in glacial hazard studies. It is well written and presents some very interesting results of GLOF reconstruction. The study has significant scientific and practical value for understanding GLOF events in the past. It confirms the scope of the journal HESS and is fit for publication (few minor comments below). The fact that Cordillera Blanca has been showing rapid glacier recession over the past few decades, there is a great need to quantify the impact of such failure events in the past. Assessment of the GLOF hydraulics helps to evaluate the extremity in terms of damage, these events can cause to the downstream regions. The data produced can be helpful in the decision-making process to identify lakes with similar potential in the valley or its surroundings. Further, it demonstrates the application of open-source

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mass flow simulation (r.avaflow) to numerically back-calculate a historical GLOF event (of Lake Palcacocha) and its cascading effect on Lake Jircacocha (landslide barrier lake). The methods are clearly outlined in the manuscript. The results produced in the study is sufficient to support the interpretations and conclusions. However, the discussion section lacks a comparative analysis, the results do not show any quantitative comparison with other studies in the region (eg. Laguna 513). Overall, it is a very comprehensive and well-written manuscript.

Few minor comments:

1. Line 42-45- I will suggest to include the latest literature here. Several GLOF impact modeling studies have been carried out in the Himalaya recently (2018-19).
2. The abstract is too general and does not reflect the specific quantitative results. Text in the abstract (line 23-24) can be shortened and instead information about the results can be included.

Figures:

Figure 1-The number of lat/long labels can be reduced

Figure 2 (f)-The impact area ends very abruptly. This is surprising. The inundation zone can be rechecked.

Figure 12 (a and b)- The terrain ends abruptly towards the downstream region (left corner); a small patch of inundation boundary is visible (top left corner), kindly recheck.

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