Dear reviewer,

thank you very much for valuable and constructive comments and suggestions. We believe that they will help to improve overall quality of the manuscript.

General comments:

Repetition will be minimized throughout the text, also abbreviations for each scenarios will be used in the next version of the manuscript.

English in whole manuscript was corrected by natural born speaker. We will arrange another language revision for the final version of the manuscript.

Specific comments:

1. GLOFs within the Cordillera Blanca significantly differ from GLOFs in other glacierised mountain ranges worldwide (Emmer and Cochachin, 2013) – This is pretty vague and needs elaboration.

- based on comparison of GLOFs in three regions (Cordillera Blanca, Central Asia and North American Cordillera) share and representation of causes of GLOFs as well as their temporal patterns were analysed; it was shown, that some causes of GLOFs have not ever been recorded within the Cordillera Blanca (e.g. dam failure following degradation of ice cores incorporated within the dam; dam failure following heavy precipitation), thus there is no need to take them into the account, on the other hand this cause was described in other studied regions
- this will be described in more detail in the next version of the manuscript

2. The characteristics which need to be taken into account in a regionally based method for assessing the potential hazardousness of glacial lakes within the Cordillera Blanca (- These are NOT regional characteristics and would apply equally well to the glacial lakes in the Himalaya, e.g. Tsho Ropla)

- generally, these characteristics were chosen on the basis of analysing previous GLOF in the region of interest (Emmer and Cochachin, 2013; Emmer and Vilímek, 2013); of course some of them (maybe most of them) are transferable to another regions
- we will be pleased, if the method will be used also for lakes within other regions, if it would be appropriate

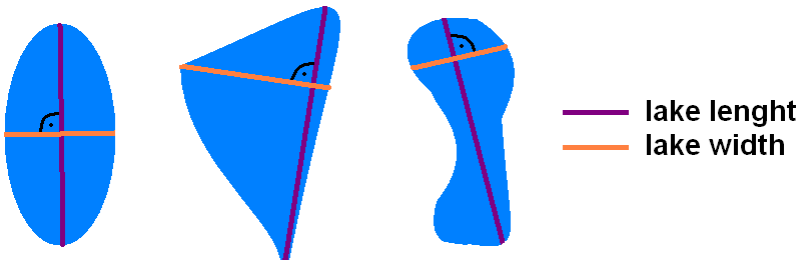
4. "(c) landslides on steep lateral moraines surrounding the lake" - Landslide could occur from the end of the lake or from a slump of terminal moraine

- accepted, use of inappropriate term
- this will be replaced by "landslide on moraines surrounding the lake" through the whole text

5. Term "maximal lake width" needs to be defined, perhaps in diagram

- "lake lenght" is defined as the shortest (linear) connecting line between the most distant opposite lake shores; this line devides the lake shore into the two parts (banks)
- "maximal lake width" is defined as the shortest (linear) connecting line between the banks in the widest part of the lake (perpendicular to the lake lenght); see Figure 1
- will be explain in more detail in Table 3

Figure 1. Examples of lake lenght and maximal lake width at model lakes



6. The physical meaning of "potential for icefall into the lake" based on the ratio is unclear and needs to be explained in physically meaningful terms.

- Eq. 1 is used only in case of proglacial lakes (Dis = 0 m)
- the ratio of width of calving front to the maximal lake width (Eq. 1) is used to simplistically describe potential for appearance of displacement wave(s) induced by fall of a part of front of calving glacier into the lake, with limited requirement of input data
- it is clear, that potential is increasing with increasing width of calving front
- width of calving front (m) need to be dimensionless for the purpose of obtaining comparable results between lakes, thus, we decided to relate width of calving front to the lake width

7. Subjectivity - "assess the potential for a landslide of moraine innto the lake" "on the basis of manual expert analysis" this seems to remove the objectivity here.

- this is commented also in second review by Dr. M. Mergili:
- the term „objective" was perhaps a little bit inappropriately used to described the fact, that presented method should provide identical results for different assessors in case of the same input data; construction of the method is not fully objective and thus, we will eliminate usage of this unsuitable term „objective" in the next version of the manuscript.

8. Lake volume equation – why not use the bathymetry ?

- generally, bathymetry is available only for about 40 lakes (2 % of overall number) within the Cordillera Blanca
- to be able to assess potential hazardousness of the lake, for which is not available, equation describing relation between lake volume and lake area (Eq. 4) was done

9. *“An assessment of the potential for a flood wave from a lake situated upstream is only meaningful when the ration of the upstream lake volume to downstream lake retention potential (rV/Vret [unitless]) is higher than 1“ - This does not seem include the possibility that the release from the upper lake could create a wave in the lower lake that overtops the dam, or perhaps I am missing the point here. Depends on definition of „retention potential“ of lower lake (eq. 6). No good reason for eq. 6 is given and this must be explained, especially how the equation accounts for the possibility of a wave overtopping the dam.*

- presented method does not account with possibility of significant displacement wave created by flood wave from a lake situated upstream, we rather expected gradual increase of downstream lake water level (in comparison with icefalls or landslides)
- “retention potential“ described in eq. 6 is used to quantify absorbable volume of water before the dam crest will be reached (the assumption of gradual filling)
- this will be discussed in the next version of the manuscript (section 4.2)

10. Equation 8 for the Critical Area of a lake seems to be somewhat subjective in that it is based on the experience of one lake and expert opinion. What is the effect of implementing this suggestion? What sensitivity analysis has been done to assess the impact of choosing this parameter (0.05) rather than some other value

- we assume, that upstream situated lakes with area equal or lower than 5 % of downstream situated lake are not able to consequently cause GLOF from downstream situated lake
- the value 0.05 was chosen subjectively and no sensitive analysis has been done for this purpose
- this will be discussed in section 4.3

11. *“With reduced demands on input data, the dam material is only characterized by dam type (moraine dam x bedrock dam).“ How is the dam type determined “on the basis of remotely-sensed high resolution images and digitam (spelling?) terrain model, without any field survey“??*

- distinction between dam types requires manual of assessment
- this is also discussed in part 4.3 - disadvantages of the method, point b.

12. How did authors arrive at Equation 10? This is not clear and either additional elaboration is needed or the equation should be justified with some reference to the literature.

- eq. 10 is designed to describe erodibility of moraine dam
- erodibility of moraine dam is hardly quantifiable without any field survey, thus needed to be simplified
- in presented method, erodability of moraine dam depends on: a) slope of distal face of the dam (dam erodibility is increasing with increasing slope of distal face of the dam;

idealised assumption of uniform composition of different dams), and b) peak discharge (erodibility is increasing with increasing peak discharge)

- in the equation, peak discharge is substituted by peak discharge factor (PDF), see comment below

13. Equation 11 seems to assume that the entire volume of the upstream lake is released into the downstream lake. This seems unreasonable and needs to be justified or modified. Also, check the units of the equation $((m^3)/(m^2))^2=m^2$ *which are not the units of discharge* (m^3/s). *The authors assume „The power of two was used to emphasize the non-linear trend in the flow rate increase", but very little justification is given for choosing this exponent.*

- yes, we do not take retention potential of valley between upstream and downstream situated lake into the account

- generally, retention capacity is hardly quantified and meaningful calculation requires complex assessment procedure, where detailed terrain models as well as information about material of valley floor and type and density of vegetation cover should be included. In extreme cases, valley floors of Cordillera Blanca valleys between two consecutive lakes are made of solid bedrock with steep gradient and retention capacity between these lakes is close to zero; therefore we decided to skip retention capacity, even if some result of potential hazardousness of downstream situated lake may be overrated (part of escaped water may be retained in the valley)

- this will be also added into the discussion, part 4.2 Potential sources of errors

- peak discharge factor (PDF) is designed to substitute peak discharge and is calculated as a power of two of a difference between upstream lake volume and downstream lake retention potential divided by downstream lake area (eq. 11)

- power of two was used because the peak discharge is increasing exponencially with increasing height of water level, which is expressed as a (*V-Vret / A;* [m])

14. *"A comparison between the pre-GLOF conditions of the lakes which have produced GLOFs with those which have not should highlight the most susceptible lakes for each scenario."The assumption is that the presented method should clearly distinguish between lakes which have already produced GLOFs and those which have not." Some of the lakes concern in the Cordillera Blanca have yet to evolve to the state at which they may be dangerous, but they may reach this site in the next 1-2 decades. Clearly, the authors have not deal with this in their method. Does the method have the ability to analyze situation where the conditions of the lake(s) may change considerably over time and progress from a relatively safe state to one which is dangerous.*

- proposed method is designed primarily to assess contemporary state, on the other hand it is also possible to assess evolution of potential hazardousness of specific lake in time (it is possible to assess potential hazardousness retrospectively); from this point of view, over a

longer period stable lakes should reach the same results and results for unstable (evolving) lakes should change

Best regards

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