The Cryosphere

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Discussions

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comment

Interactive comment on "Tracking the impacts of the Aru glacier collapses on downstream lakes" *by* Yanbin Lei et al.

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General response: Thank you very much for the constructive comments and suggestions. We will revise the manuscript carefully according to these comments.

The purpose of the study is more like two downstream lakes observation after Aru glacier collapses events. Hence, I would suggest change the title as "How two downstream lakes responding to Aru glacier collapses and their changes based on in-situ and Remote sensing data " or others.

Response: Thanks for the good suggestion. Following your suggestion, we would like to change the title as 'How did the two downstream lakes respond to Aru glacier collapses?'

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Discussion paper

From the abstract, I got the information that the glacier collapses have two impacts on two lakes, that is, short-term (LST and lake level) and long-term impacts (Lake level and others). So, I would suggest authors refine the rules and results.

Response: Thanks for the suggestion. We will revise the abstract carefully according to this time line.

Line125 here, authors should give the methods how to get lake level changes and how to calculate the uncertainty of lake level changes.

Response: We will address this in more detail. The reconstruction of past lake level changes and its uncertainty will be addressed and estimated.

Line 130 The important feature of 2 degree decrease after collapse was success to be caught by using MODIS 8-days. And I also understood that it may be difficult to express the temperature field due to resolution (1km). But it is useful to compare between the records from AWS during Oct 2016 and Sep 2019 and LST.

Response: Thanks for the good suggestion. We agree that it may be difficult to express the temperature field due to its resolution and shape of Aru Co because the lake is very narrow and long. We will compare MODIS LST at Aru Co with air temperature from AWS between Oct 2016 and Sep 2019 in the revision.

Line 145 here, Authors can mark where is norther basin, south basin and center part of Aru Co/Memar Co in figure 1.

Response: Thanks for the good suggestion. We will show this in Figure 1.

Line 208 section 4.3 this lake level and lake expansion are chaotic. It should be clear.

Response: Thanks for the suggestion. The section 4.3 will be divided into three sections, including Section 4.2, The meltwater estimation of the two ice avalanches; Section 4.3, impact of the meltwater on the seasonal lake level changes of Memar Co; Section 4.4 impact of the meltwater on the inter-annual lake level changes of Memar

Co.

Line 261. I agree on your opinion that after collapse, the lake level increase in warm season rapidly. Did you have any evidence from glacier ablation observations

Response: Meltwater will also be calculated by degree-day model according to in situ observation and AWS meteorological data nearby. So the contribution of meltwater to seasonal lake level change will be further quantified.

Line 270 the lake skin temperature? Water body temperature? Freeze up-?ice on is "Break up" melt on or melted?

Response: Lake skin temperature derived from MODIS data is usually considered to be different from lake body temperature. Lake skin temperature is the water temperature at the few millimeters water depth while water body temperature is measured at the depth 30-50 cm. Freeze up is lake surface is covered by ice and break up is lake ice melts.

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2020-117, 2020.