

## ***Interactive comment on “Water storage and drainage of short-lived lakes in the Teskey Range, Central Asia” by Mirlan Daiyrov and Chiyuki Narama***

### **Anonymous Referee #2**

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Water storage and drainage of short-lived lakes in the Teskey Range, Central Asia

by Mirlan Daiyrov and Chiyuki Narama

General comments:

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This is an interesting study about ice tunnels of short-lived lakes in parts of the Tien Shan. A main problem with the paper is that it becomes not very clear over large parts what its focus is: Is it ice tunnels, is it Korumdu lake? Is Korumdu lake an example, or a main focus? Why Korumdu lake? The authors should at the beginning develop and

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explain the purpose of the paper, and then relate to this purpose throughout the paper more clearly.

Specific comments:

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Abstract:

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The abstract is unclear. Needs to be rewritten thoroughly. What is the relation of Korumdu lake with respect to the other lakes, not mentioned by name? Only later in the text it becomes clear that the paper is about Korumdu lake.

Introduction:

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Well written, but I recommend an additional paragraph summarizing the previous findings from a number of papers of the authors about short-lived lakes, and how this paper relates and adds to these previous papers. Is it a new outburst, not covered in the previous papers? Why was it not covered in the previous overview papers. Something special with this lake? What new knowledge is expected compared to the previous papers? Is there a special focus of this study (on ice tunnels?), not covered in the other studies? Etc.

Study area:

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This section suffers from the lack of clarity in the paper focus. You introduce the study region, not the lake Korumdu, but then you start investigating one specific lake. You need to introduce the region and the specific lake, and make clear why you investigate in detail lake Korumdu. What makes this lake particularly useful or necessary for ice

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tunnel investigations in addition to the ones studied earlier?

Results:

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L189: too low for drainage? Do you mean the lake did not run over in 2016 and 2018? Where did the melt water from the basin go then?

Discussion:

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L250: deposition-closure type? This term/type was not introduced before. What is the difference to the deposition-freezing type? L254-256: I don't understand these sentences. "inevitable"? Do you say every moraine complex will lead to a short-lived lake? I don't get the purpose of the last sentence. L270: But what causes what? Does more discharge lead to larger tunnels, or do larger tunnels enable more discharge. I would expect that large discharge melts the tunnel walls and enlarges the tunnel. But you seem to argue that other way round? Further: what influence has the drainage catchment size and the amount of melt water available? Could it be that larger catchments produce more water which then causes larger tunnels?

Conclusions:

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Why don't you summarize your two types of tunnel closures? I think these are important to understand your conclusions of paragraphs 1 and 2. Last paragraph needs rewriting. Especially the conclusions regarding hazards are not well discussed and backed-up in the text.

Technical corrections:

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Line 49: "but this relationship was so far little studied with regard to proglacial lakes as of concern in this study." Or something like that. L54: supply "from"? L55: from the "lake" depression L64: As changes "related to short-lived lakes" can occur. . . L74: clear -> clarify L110: SA) Structure from Motion. Remove "of" L131: does the lake need to "double"??? or just increase in area? L155: lake is of flood-wave type. . . Do you want to say that the slope is too low that the flood would incorporate debris and become a debris flow?

Fig 5: can you remove the blue tone of the photos by improving the colour balance?

Fig 7: there are no panels c and d as indicated in the caption, and I guess b is placed wrong. Fig 11: indicate that dark blue in the tunnel is frozen

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