

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2  
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## **Comment on nhess-2020-418**

Anonymous Referee #2

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Referee comment on "Atmospheric triggering conditions and climatic disposition of landslides in Kyrgyzstan and Tajikistan at the beginning of the 21st century" by Xun Wang et al., Nat. Hazards Earth Syst. Sci. Discuss.,  
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The paper is well written and structured. There are a couple of things that need to be further specified.

I would suggest using different terms instead of "climatic disposition/climatic disposition maps". Perhaps "climatic predisposition to landslides/climatic predisposition maps" better explain the concept.

Then, it could be useful to describe the limitations in the use of gridded products in detecting atmospheric triggering conditions.

About section 2.1.2 Atmospheric data, I recommend including a more detailed description on how the amount of snowmelt has been calculated using the Surface Energy Balance (SEB) and how the thickness of the existing snow is calculated/taken into account in the snowmelt evaluation.

Section 3.2 presents Cumulative distribution function (CDF) curves of mean intensity ( $I_{mean}$ ), maximum intensity ( $I_{max}$ ), and accumulated amount ( $Q$ ) of non-landslide triggering event (NLTE), landslide-triggering entire event (LTE entire), and landslide-triggering up-to-landslide event (LTE UTL) for rainfall, snowmelt, and rainfall+snowmelt. What is the probability density function used to calculate the CDF? Please describe.

Please check line 177-178, the colours of the points, probably, have been inverted.

About figure 5, can you please comment on the fact that for very small values (0,1) of snowmelt for  $I_{max}$ ,  $I_{mean}$ ,  $Q$ , there is around 60% probability of having LTE and UTL. It could be useful to exclude from the analyse the rainfall and snowmelt events with  $I_{mean} = 0$ ,  $I_{max} = 0$ , and  $Q = 0$ .

About the indicators used to evaluate the thresholds performance, it could be interesting to calculate the efficiency index  $(TP+TN/TP+FP+FN+TN)$ ; please check literature in this regard). It can be seen as a single indicator for quantifying the correct perditions over the total. It could be used in replacement of HR and FAR and compared with the AUC.

In section 4. Discussion, could be useful to comment also about the lack of information on the landslide types. Also this aspect increases the uncertainty of the results.