

***Interactive comment on “Statistical Characteristics of Mudflows in the Piedmont Areas of Uzbekistan and the Role of Synoptic Processes for their Formation” by Gavkhar Mamadjanova et al.***

**Anonymous Referee #2**

Received and published: 30 June 2018

After the careful reading of the manuscript “Statistical Characteristics of Mudflows in the Piedmont Areas of Uzbekistan and the Role of Synoptic Processes for their Formation” I believe that this is a good contribution to the study of the synoptic processes and its relation to the mudflow occurrences in Uzbekistan. Also, a statistical model (Antecedent Daily Rainfall Model) to evaluate the probability of daily rainfall resulting into mudflow was also produced. This study represents a good contribution to the understanding of the SWT and CWT associated with the mudflows events and the ADRM to evaluate the probability of a daily rainfall to produce a mudflow in the study area.

C1

This study is definitely in the scope of NHES. Despite of these studies are not completely innovative, this work is interesting and its methodology can be applied for other study areas than Uzbekistan. I recommend moderate revisions and my advices and reasons are listed below. 1. Scientific data and results sometimes are not presented in a very clear way, and the manuscript structures sometime mixes state of art text with results, which make the ideas difficult to understand. 2. Presented results are sufficient to support conclusions but I would recommend improve the conclusions section with some discussion about the data sources issues (e.g. debris flow database, daily precipitation, CWT) that the authors faced in this study and that can be important to the use of this methodology in other study areas. 3. Number and quality of figures/tables – I strongly recommend to reduce the number of figures. 4. English language deserves a moderate revision. 5. The title includes statistical characteristics of mudflows but in practice the main purpose of this work is to relate mudflows with the role of synoptic processes. I suggest removing the statistical characteristics from the title. 6. In the introduction section it misses geological characteristics of the country in order to understand the mud flow distribution, conditioning and triggering factors. Also the last paragraph of the introduction section is not mandatory to understand the work, so I suggest removing this paragraph. 7. Section 2.1 – Data – in this section is not clear how many meteorological stations will be used in this study and which one is located in the mountains and which one is located in foothill zones. This must be clear as also the data period of each station. 8. Section 2.2 – Methods – in this section misses a subtopic concerning the SWT. This text can be added from page 8, section 4.1, where authors mix the state of art of SWT with the results. With this change the methods text will include all methods used in this work. In this section it must be explained how the mudflows around the climatological stations were selected. It was used some kind of buffer or other criteria? Please explain this in the text. 9. Page 5, first paragraph – When authors refer some examples of works that used the calibrated antecedent rainfall model, the reference Zêzere et al (2015) did not used this method as you can verify in the original source. It was used in a previous work by “Zêzere and Rodrigues (2002)

C2

Rainfall thresholds for landsliding in Lisbon Area (Portugal). In: Rybar J, Stemberk J, Wagner P(eds) Landslides. Lisse, A. A. Balkema, pp 333–338”. 10. Section 3.1 – general climate conditions – second paragraph – “the long term climatological shows. . .” – please refer how many years correspond to this long period of climatological data. 11. Page 6, line 25 – “The spatial distribution of the average precipitation. . .” – again please refer the period of this data. 12. Section 3.2 – mudflows in Uzbekistan – you should specify which are the data sources of the archive data of mudflows. 13. Page 7 line 26 – why do you use the terms episodes and events of mudflows? It has the same meaning? Please clarify this topic in the text. 14. Authors relate the highest peaks of mudflows in the 1930s, 1960s and 1990s. I ask if these peaks can be related with some land use changes occurred in the country. 15. Sections 4 and 5 are more related to the results presentation, so the text needs to be improved and better structured. In the section 4.1 the text must be limited to the results and the part related to the methods can be included in section 2.

Notes about the figures: This work should reduce the number of figures and tables. 1. Figure 1 – it misses a scale and a north arrow in the map, and also the name of the neighboring countries. 2. Figure 2 – figure caption is confusing. It can be only methodological flowchart. 3. Figure 3 - these stations are located in which basin? 4. Figure 4 – this map has several cartographical problems. The legend and the north arrow should be reduced because its size is over exaggerated in comparison to the map size. Erase the title “distribution of precipitation” because the figure caption will detail that information. Again it misses the scale in this map. This figure caption can be simply “total annual precipitation. . . .” because there is no need to repeat that this is a map. 5. Figure 6 – the figure caption can be only “Monthly mudflow frequencies. . .” 6. Figure 7 – it misses the legend of the codes used in this figure in order to be understandable. 7. Figure 8 – please specify for which area corresponds this graph. 8. Figure 10 – b) it misses the legend of the triangles or put the name of the stations in the figure. C) include the units of the legend (Fig10c) and remove the blue from the legend because it has no cartographical representation. 9. Figure 11, 12 and A2 and A3 can

C3

be joined in two figures. In the first figure you can put a) and b) for the 4 study areas (one page) and in the second one you can put c) and d) for the 4 study areas (one page). With this solution you reduce the number of figures and also the reference of these figures in the text will be clearer. Also reduce the figure caption of these figures, removing some text that can be referred in the text. 10. Figure 14 – reduce the length of the figure caption because it is too long and include the example in the text, not in the caption. 11. Figure 15 – include the meaning of the red lines in the graphs. 12. Figure 16, 17, A5 and A6 in my opinion are not necessary to understand the results. Please consider remove these figures or other alternative to reduce the number of figures.

Notes about the tables: 1. Table 1 – it is necessary to put the unit of each row of the table.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-128>, 2018.