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Reply on RC1

Juan Antonio Luque-Espinar et al.

Author comment on "Spatio-temporal analysis of the role of climate cycles on landslide activity: the case of Majorca (Spain)" by Juan Antonio Luque-Espinar et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-50-AC1>, 2022

Dear Dr Hergarten

Firstly, thank you very much for taking the time to read the submitted paper, and thank you for your comments. They will certainly help us to improve the article.

We undoubtedly agree that factors such as relief, geology, slope orientation, etc. condition the occurrence of landslides. It is also widely known that heavy rainfall is the main trigger of landslides, and intense rains are often orographically controlled. There is extensive literature on this subject. Likewise, it is also known that certain natural climatic cycles, such as ENSO, NAO or sunspot, have a clear relationship with landslides and flood records, an aspect that has also been analysed in different publications, including the authors of the present paper. However, the really novel aspect of this work, and the main reason for the publication, is the spatial (and not only temporal) behaviour of climate cycles. As we know, they do not have a homogeneous spatial distribution. In this sense, once the rainfall cycles have been analysed and the ones most related to landslides or floods are identified, the mapping of these influences becomes a (powerful?) prevention tool.

In this work, the use of the inventory of rockfalls in the Tramuntana Range is a first step to validate the methodology here shown, as it can be applied in any region, regardless of its location and climatology. What is relevant is the temporal/spatial analysis of the natural cycles. However, it seems appropriate and a relevant advice from you to validate the climatic results with all the rockfall records, taking into account their volume; not only with the five largest ones.

In summary, we would like to stress that what is important in this work is the methodology, by applying statistical tools. The landslide inventory serves only to validate the results. It is not a work on landslides, as the methodology could be applied to any other hydroclimatic risk.

Many thanks and kind regards