

Interactive comment on “Rainfall and weather conditions inducing intense landslide activity in northern Spain (Deba, Guipúzcoa)” by Victoria Rivas et al.

Anonymous Referee #2

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The authors argue that the massive occurrence of landslides in the study area is due to a Mediterranean-type rainfall regime. The statement is based on the analysis of 6 multiple landslide events (MORLE) responsible for 58% of the slope failures that occurred during the last 60 years. From them, they derive an empirical rainfall threshold. The topic is of interest and is yet another attempt to identify the landslide-triggering rainfall thresholds for prevention purposes in different regions in the world.

In the work presented by the authors there exist some points that should be clarified.

1) The number of (new) landslides that each event (MORLE) triggers is obtained from the analysis of successive aerial photographs. There are however, three temporal

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windows showing a significant increase of the number of landslides whose trigger is undetermined (1954-1970, 1970-1983, 1993-1997). In these cases, the number of new landslides is almost one order of magnitude greater than the MORLE of August 2011 and November 2011. I suppose that the authors have not been able to identify a sufficiently intense and persistent rainy episode that justifies the occurrence of a high number of slope failures in the undetermined cases. However, how should this occurrence be interpreted?

2) Lines 121-127. In relation to the previous comment, the authors indicate that the data were filtered to accommodate the rainfall (24-h accumulated rain) to the known time of failure. Please, explain what you exactly did. One example would help the reader to understand the procedure followed.

3) Figure 3b and lines 213-219. The interpretation of the “undetermined event” in terms of landslide occurrence is confusing. The authors should discuss and clarify it. Although there are many low intensity rain episodes associated with “undetermined activity”, there are also high intensity rain episodes associated to them. In fact, if we draw an envelope line below the 5 most intense MORLES (except 2002), there are more “undetermined” rain episodes than MORLES.

4) Lines 240-241. In relation to the latter comment, if the authors shift the I-D line downwards, then the number of “undetermined” events and even “no-landslide events” will increase. In consequence, using this I-D line as “warning” (as stated in lines 245-246) or “prediction” (line 307) does not seem reasonable because the percentage of false alarms will be high. Maybe the authors should prepare a confusion matrix and discuss this issue more in depth.

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