

## ***Interactive comment on “Erosion after an extreme storm event in an arid fluvial system of the southern Atacama Desert: an assessment of magnitude, return time, and conditioning factors of erosion caused by debris flows” by G. Aguilar et al.***

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The authors present an interesting piece of research on erosion related to debris flows in the southern Atacama Desert, Chile, during an intense rainstorm, concluding that sediment storage in the channels is much more important than sediment supply by slope processes. The work is certainly scientifically interesting and within the scope of the journal. The manuscript is largely well-structured and the illustrations are appro-

C1

priate and very well-designed. Grammar and style are of reasonable quality at the beginning of the paper, but degrade significantly afterwards. Maybe also for this reason, there are some aspects which are not clear for me and where I suggest rewriting. Therefore I recommend moderate-major revisions. Please find my detailed comments and suggestions below.

Most importantly, carefully check grammar and style (maybe you can ask a native speaker to go through the text). Below I highlight some, but not all language issues I have identified.

Title: "erosion caused by debris flows": is it really the debris flows which caused the erosion, or is it the reverse way, or both?

P2, L32: "On the other hand ...": Something is wrong with the structure of this sentence, please reformulate.

P3, L4f: How do you know about the different rheologies? Analysis of deposits, interviews with witnesses, ...?

P3, L7: lectors -> readers

P5, L2: time return -> return time

P5, L11f: If no debris flows were reported, does it really mean that no sediment was delivered to the trunk valley? Even though you use a rather broad definition of debris flow, there might still be some fluvial sediment transport.

P3, L24: Rills and gullies are not processes, but landforms - better replace "processes" by "indicators".

P5, L22f: What is the difference between slope and gradient?

P5, L23: lineal -> linear

P6, L12: "is added" should be removed.

C2

P6, L22-29: This paragraph should be moved to the section on the study area, as it represents some general information, not the results of the study.

P7, L16: "Andean catchments": the Andes are thousands of kilometres long, please be more precise ("arid Andes of northern Chile", or whatever is suitable).

P7, L21 and some other places in the manuscript: alluviated -> alluvial

P8, L5f: "high latitude rainfalls": please mention to which region you refer exactly (Patagonia?)

P9, L4: "first phase of risk study inhabited areas": I don't understand this formulation.

P9, L10: Only in Chile, or is it relevant in mountain areas worldwide?

P9, L21: The recurrence time decreased (it is the frequency which increased).

P9, L33f: "The integration ...": I do not understand this sentence, please reformulate.

P10, L27f: But how does the sediment get into the channels? On long (geological) time scales, hillslope processes probably play a role?

Fig. 5 and Fig. 8: It could be interesting to see the  $R^2$ -values in each of the diagrams.

In case the authors would like to discuss the one or the other issue, they should feel free to contact me at [martin.mergili@univie.ac.at](mailto:martin.mergili@univie.ac.at).

With best regards

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