

Earth Surf. Dynam. Discuss., referee comment RC1
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Comment on esurf-2021-4

Anonymous Referee #1

Referee comment on "Stochastic alluvial fan and terrace formation triggered by a high-magnitude Holocene landslide in the Klados Gorge, Crete" by Elena T. Bruni et al., Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2021-4-RC1>, 2021

This is a very timely contribution when we are slowly moving away from rather simple-minded interpretations of alluvial strataigraphy to take extreme events more into account. That said, my only criticism of the paper is that the theoretical component is not as strong as it should be. Bodies of alluvium that are interpreted to be a result of a change of climate for example may be the sum total of extreme events, the frequency and magnitude of which are modulated by the ambient climate. So there may not be a substantive difference between the traditional interpretation and what the authors of this paper claim to be stochastic events. I would like to see an additional paragraph that sets out the authors' views on this issue.

My other comments are more minor, as follows:

1. line 22 what is meant by 'intermediate fan'? Clarify.
2. lines 62 and following. The absence of reference to the roles of land use in the alluvial stratigraphy of the Mediterranean is puzzling. See the early work of Claudio Vita-Finzi for example. Please include some reference to this phenomenon.
3. line 80 please explain why this catchment is anomalous
4. line 2 108-109 what is the evidence for this statement?
5. line 165 and following. While there is discussion later on about the accuracy of these

C-14 dates from bulk organic matter, please provide a brief preparation here for that later discussion.

6. line 228 (and 253) I am unconvinced that these deposits are from sheet flows. I would not expect the shear stresses needed to move the gravel particles can be achieved by sheet flow. Please provide evidence of your claim or perhaps suggest that the deposits are a result of flow in shallow channels.

7. line 322 reference here to slackwater deposits may be inappropriate. This term is now used for palaeoflood deposits. I suggest that you find an alternative or, if they really are slackwater deposits, please provide more information.

8. lines 346 and 347. the negative exponents need to be changed.

9. line 377 here and elsewhere you refer to immature soil development but I cannot find an argument for their immaturity. This needs to be rectified.

10 line 503 you claim that this catchment is unique but do not explain why. Also see my comment #3 above.

11. line 507 please explain why the landslide deposit made this catchment ultra sensitive to external forcing.

12 line 547 this is not a recurrence interval but a frequency. Please change.