Dear editor,

Thank you for the positive feedback. We revised the manuscript according to your comments and provide a point-by-point response.

Kind regards

Paulina Grigusova

Dear Authors,

Thank you for submitting your revised manuscript and responses to the reviewers' comments. I found both reviewers to be quite positive regarding the scientific significance of your work. I also found your manuscript to present a methodologically interesting advancement in studying how animal burrowing cause sediment redistribution. Because of the extensive nature of the revisions, I would like to send out your manuscript for review again. But first, please address the following minor to moderate points:

• L86: Here and throughout the manuscript, the German 'und' is used instead of 'and' between two cited authors.

We corrected the reference style as requested.

• Throughout the manuscript: In addition to the above error, there are several small typographical errors with missing periods or odd word choices. I have commented on a few of these below and the manuscript will be subjected to language editing if accepted, but please take the time to do another careful read-through of the manuscript before submitting.

We reread the manuscript and corrected the typographical errors.

• Introduction: I agree with Reviewer #2 that a description of a low-cost ToF is needed. Although you have added a description in the second to last paragraph of the Discussion and expanded the description in the Methods section, the manuscript is still lacking a clear and concise description of what ToF photogrammetry is in the Introduction. Furthermore, what gap or problem from other types of photogrammetry does ToF fill. You describe this in the Methods, but it would be helpful to have the advantage of the system introduced in the Introduction to understand the significance of the work.

Thank you for this comment. We expanded the paragraph in the introduction as follows (Lines 122-127):

The Time-of-Flight (ToF) technology offers here a new possibility for surface monitoring, as a technique for a cost-effective high-resolution monitoring of sediment redistribution (Eitel et al., 2011; Hänsel et al., 2016) which can be achieved by a simple installation of one devise in the field is missing. ToF-based cameras illuminate the targeted object with a light source for a known amount of time and then estimate the distance between the camera and the object by measuring the time needed for the reflected light to reach the camera.

• L346-348: These sentences were added as a response to R2C22; however, I do not think that this completely answer the reviewer's question. The reviewer requested information on how you handled sediment redistribution caused by different processes, but the added text only describes how you may notice if there are several processes occurring. Please elaborate how you are able to parse out effects of different processes.

We explained the data processing in more detail (Lines 350-355):

If both animal-caused and rainfall-caused sediment redistribution took place, the following conditions applied: i) rainfall event occurred, ii) burrow size changed, iii) sediment eroded from not affected areas. Here, the animal-caused sediment redistribution was calculated as the sediment volume excavated from

the entrance. The rainfall-caused sediment redistribution was calculated as the sediment volume which eroded from the burrow roof and mound. To this amount we added the animal-caused redistributed sediment volume, as this sediment accumulated on the mound.

• L397-98: Given the authors' lengthy response to R2C25, I would like to see a condensed version of that response in the manuscript text to justify using the 7 months of data to extrapolate to one year. For example, I would highlight the high quality of the data used in this study, where there are in fact 7 months of data rather than only one event to extrapolate from, so this shows an advancement in precision of annual sediment redistribution.

We agree and we included the arguments in the manuscript (Lines 387-396):

Please note that we used the volume of redistributed sediment monitored for 7 months to calculate the volume of sediment per year. We decided to upscale due to several reasons: In contrast to previous studies, our study provides daily data on sediment redistribution which allow a more realistic temporal upscaling than the data sampling with lower frequency. All previous studies estimated the volume of redistributed sediment per year, even though the measurements were conducted less frequently (Table A6, A7 and A8) or even when the measurement was not repeated at all (Übernickel et al., 2021b). These studies thus completely ignored the ongoing sediment excavation and erosion processes. Our study was conducted from middle autumn to middle of spring and thus covered exactly half of the vertebrate burrowing season (Romanach et al. 2005), including dry and wet seasons, thus capturing the key cycles of variability.

• L590: I would recommend against a paragraph containing only two sentences. Combine this to another existing paragraph or expand on this idea.

We combined the paragraphs.