Dear Todd Ehlers,

Thank you very much for comments. We adjusted the manuscript for the final upload accordingly.
Please find the adjustments below.

Kind regards,
Paulina Grigusova

Abstract:
Ln 142. The sentence doesn't make sense. Reword. Sounds like you are trying to make a comparison,
but it's not clear what you are trying to say.
We removed the sentence from the manuscript, as it did not provide any new information.

1. Introduction:
Ln 221. Avoid 1 sentence paragraphs. Merge with another one.
We merged the paragraphs.

Ln223. "The" impacts.
We adjusted the sentence.
Most landscape models do not yet implement the impacts of bioturbators on water and sediment
fluxes.

Ln226. Complete the thought :-).
We completed the thought.
Our study shows the importance of including bioturbation into erosion modelling, and describes the
interplay between bioturbation, environmental parameters such vegetation or topography, and
sediment redistribution.

2. Study Area
Ln269. Replace 'vegetation' with 'ecological'
We replaced the word:
Our study was performed along a climate and ecological gradient in Chile.

3 Methods
Ln 331. I don't understand the dimensions here. You give 3 different dimensions for something that is
2 dimensional (a sheet of fabric). Please reword so it's clearer what you mean. You could also
illustrate the dimensions in fig3b.

We rephrased the sentences. We do describe a 3D object:

The sediment traps consisted of geotextile and wooden poles and had a length of 2 m – 5 m. 1.5 m of geotextile was laid horizontally down at the surface and 1 m of geotextile was vertically attached to wooden poles to enable the collection of sediment. (Figure 3b).
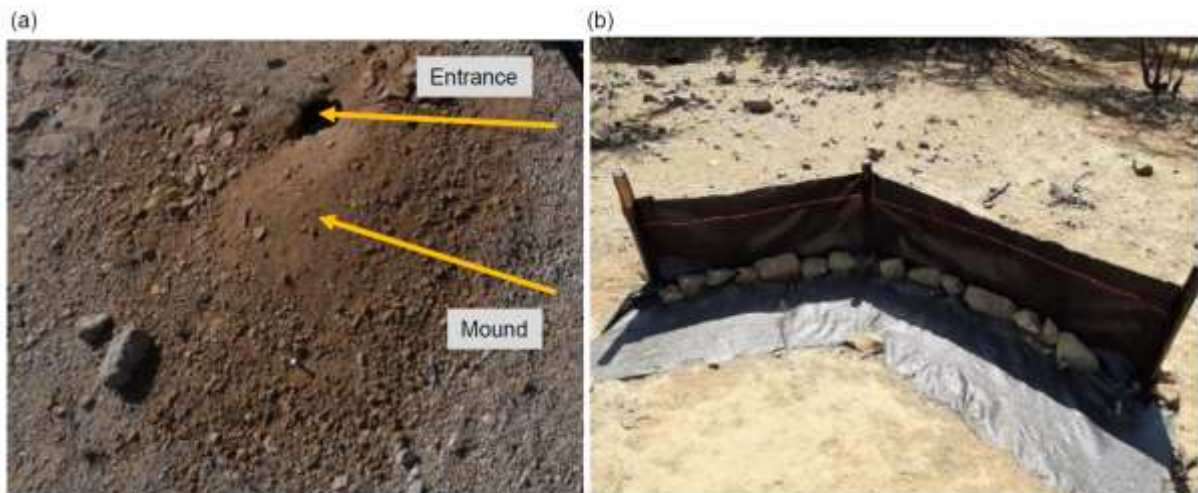
Figure 3. In-situ constructions. (a) Example of a burrow consisting of burrow entrance and mound. (b) Fence construction used for the collection of eroded sediment to validate the model. Both photos by Paulina Grigusova.

Ln395. Reword. Unclear.
We rewrote the sentence: To calculate the TPI, the average elevation of pixels within a range specified by the user needs to be subtracted from the elevation of the central pixel.

Ln 418 "in the R statistic…"
Data pre-processing, modelling and analysis (see Fig. 2) was done in the R statistic environment.

Ln447. Merge the sentence with the following paragraph.
We merged the paragraphs.

Ln 464. Are there units on these numbers? Or perhaps explain how this accuracy what calculated, e.g., the accuracy (calculated from ….) was ….
No, accuracy of a classification does not have units. We added the explanation how the accuracy was calculated: The accuracy of the classifications was estimated by dividing the amount of correctly classified pixels to the amount of all pixels.

Ln475. Split words apart.
We did: The size, geometric structure and excavation rates of burrowing animals were previously estimated at a high spatial and temporal resolution.

Ln498. Finish the thought.

We removed the sentence as the issue is explained within the following sentences.

Ln 553. "No" or "a" correlation.

There was a correlation between some of the spatial model parameters.

Ln567. Reword, awkward.

The model performance increased when burrow entrances (R^2 = 0.48, RMSE = 0.61, MSE = 0.78), or mounds (R^2 = 0.51, RMSE = 0.75, MSE = 0.57) were include to the model.

Ln596 'animals'

The magnitude of the sediment excavation by the animals exceeded sediment erosion which occurs during rainfall events.

Ln600. What context? Be more specific. Local conditions such as … and ….?

We removed the sentence as we describe this context within the whole section 4.4.

Ln644 "individual animals"? Not sure what you mean.

We mean the transport of the sediment to the surface by animal excavation.

We included transport of the sediment to the surface by animal excavation into the model.

Ln647 "in the arid"

Burrows were mostly distributed within groups of several burrows in Mediterranean LC and semi-arid SG, while they were more evenly distributed in the arid PdA and humid NA.

Credits:

Ln829. I recommend adding somewhere around here a thank you statement for the reviewers (I don't expect it for me). They spent significant time on reviewers. If you don't know who they are, you can thank anonymous reviewers.

We added the statement:

Acknowledgments: We thank CONAF for the kind support provided during our field campaign. We thank two anonymous reviewers for their valuable comments that helped to significantly improve the manuscript.

Ln 826. I was unable to connect to the DOI numbers you provide. Please give the full URL. I also get an error message in Safari that the "This connection is not private" and someone may be impersonating the we site. Please check that it works before submitting the final version.

We provided the full URL:

Code/Data availability: The estimated soil properties

(DOI: 10.5678/wsrb-9f70, https://vhrz669.hrz.uni-marburg.de/lcrs/data_pre.do?citid=523),
modelled sediment redistribution (DOI: 10.5678/32wa-d179, https://lcrs.geographie.uni-marburg.de/lcrs/data_pre.do;jsessionid=22F870744C71E3DAB58C6201A5026656?citid=521)
and model code
(https://gitlab.uni-marburg.de/fb19/ag-bendix/model-sediment-redistribution-caused-by-bioturbating-animals)
was published via LCRS data services.

Note - all figures are fuzzy in the PDF I'm looking at. Please make sure that resolution versions consistent with journal requirements are uploaded.

We increased the quality of figures which we upload as a .zip file.