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Comment

Interactive comment on “Quantification of the inevitable: the influence of soil macrofauna on soil water movement in rehabilitated open-cut mine land” by S. Arnold and E. R. Williams

Anonymous Referee #1

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This discussion paper focuses on a relevant topic and points out a gap in knowledge about a problem that could occur during rehabilitation of mining sites. There are clear objectives, which the authors support with some evidence from literature. Authors have also put in their ideas that are based on valid assumptions. However, it is missing some practical examples or sufficient evidence confirming that this is an actual problem affecting the environment. It brings a novel approach, but at this stage the problem, the authors are searching solutions for, isn't supported by clear evidence.

Title of the paper

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The title contains the expression “soil macrofauna”, but the authors are only talking about ants, with termites being mentioned once but their impact is not discussed further. Earthworms should be mentioned as well, when talking about soil macrofauna, as they are burying soil macrofauna and can affect soil hydrology (Joschko et al., 1989, Joschko et al., 1992, Edwards et al.1990, Blanchart et al., 2004), or an expression soil macroarthropods or a different formulation should be used.

Structure of the text

The presentation is well structured with an Introduction that presents the topic, then two sections where the actual problem is discussed and then Conclusion and further directions, where authors summarize what they found out and what they recommend to be done.

As to the part Conclusions and further directions

Authors point out that further research on this topic is needed, which is supported by their conclusions. However, the idea of testing effect of ants and termites on soil hydrology in mesocosm experiments seems very ambitious and would also be very expensive, as both ants and termites form complicated underground galleries. The authors make this suggestion without discussing it with relevant literature that would suggest that experiments like that are viable. I would recommend to focus on field trials in post mining areas, where there are spoil heaps being colonized with soil macrofauna and this problem could occur. The hydrological and chemical parameters can be measured in field as well (e.g. Wang et al., 1995, Cammeraat et al. 2002)

References The references are appropriate and there is a sufficient number of references. However, authors have missed some papers that bring important knowledge about the effect of soil macrofauna on soil hydrological properties.

Additional recommended references

Wang, D., et al. (1995). "Nest structure of ant *Lasius neoniger* Emery and its impli-

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cations to soil modification." *Geoderma* 66(3): 259-272. Joschko, M., et al. (1989). "Assessment of earthworm burrowing efficiency in compacted soil with a combination of morphological and soil physical measurements." *Biology and Fertility of Soils* 8(3): 191-196. Joschko, M., et al. (1992). "Functional relationship between earthworm burrows and soil water movement in column experiments." *Soil Biology and Biochemistry* 24(12): 1545-1547. Blanchart, E., et al. (2004). "Effects of tropical endogeic earthworms on soil erosion." *Agriculture, ecosystems environment* 104(2): 303-315. Edwards, W., et al. (1990). "Effect of *Lumbricus terrestris* L. burrows on hydrology of continuous no-till corn fields." *Geoderma* 46(1): 73-84.

Formal side of the text

The paper is well written with clear and well-structured sentences and a minimum of formal mistakes or typing errors.

Please also note the supplement to this comment:

<http://www.soil-discuss.net/2/C530/2015/soild-2-C530-2015-supplement.pdf>

Interactive comment on SOIL Discuss., 2, 853, 2015.

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