

Interactive comment on “Animal-sediment interactions: the effect of ingestion and excretion by worms on mineralogy” by S. J. Needham et al.

Anonymous Referee #2

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General Comments

This contribution represents the preliminary examination of an interesting idea, which would have been improved by a more detailed examination of the experimental materials before publication. That said, it deserves publication as is, but represents an opportunity not fully exploited, and the work certainly raises more questions than it answers. Do I see the dread hand of the RAE influencing the authors need to publish at this time? My own expertise is in sediment geochemistry, rather than biological interactions so some of the suggested approaches may need careful evaluation. Firstly more analytical work on the faecal casts would be useful to better characterise the nature of the changes and the mechanisms involved; CHN analyses, org C content, ferrous/total Fe data and perhaps even major element analyses might be useful. An organic geochemist or a biologist might have better suggestions. I expect the changes would be small and that in turn would require replicate samples to establish the changes against the control. SEM pictures of the faecal and control chlorite might be interesting. Might

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they show the effects of ingestion by grain-size or shape changes? Secondly the experiments are also capable of providing useful quantitative data on burrowing activity; an issue of interest to the sediment geochemists involved in diagenetic modelling. Measurements could be made of the volumes of excreted material, burrow dimensions and perhaps even estimates of the proportion of the material which has been processed by an individual organism. The experiments are still running and later reports would be of increased value if there was an estimate of the number of times the sediment was likely to have been processed. I have no biological expertise and cannot comment on the suggested mechanisms by which ingestion has produced the observed changes. These changes are only small (but are well-documented) and the inference is that continued processing should produce larger changes. It would be interesting to see if this is the case.

Detailed Comments

p. 595 line 25. Lasaga 1995 not in references

p. 543 lines 15-20. I can only see the 60-9 peak in two cases.

p. 544 line 16. Peak broadening may result from grain size changes. It might be possible to establish via SEM.

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