

Interactive comment on “Earthworm impact on the global warming potential of a no-tillage arable soil” by M. Nieminen et al.

M. Nieminen et al.

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We were glad to read that the Referee regarded the study as a useful contribution to the discussion on the subject. We acknowledge the helpful comments which are each addressed below. The page and line numbers refer to the revised manuscript which is submitted as a supplement to this response.

COMMENT: Add into the introduction a line or two about anecic earthworm burrows as hydrological short circuits of the biologically most active zone in the soil.

REPLY: The role of *L. terrestris* burrows as bypass flow routes for percolating water and topsoil nutrients is now explained in the Introduction (P4L23-25).

COMMENT: Also I disagree with the overall conclusion page (6344, line 16- 24), maybe

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not in principle but in the strengths of the statements. The authors only worked with one field soil and so I would argue that they did not fill "the gap" but "contributed to filling a gap" and "the study further pointed out that more studies on the effect of conservation practices need to be carried out to fully understand their effect on the environment."

REPLY: We toned down our conclusions as suggested (P17L23) and added a final sentence to point out the need for studies of the effects conservation practices in general (P18L6-8).

COMMENT: I don't think one can easily extrapolate from midden-scale to a larger scale as there may well be some competition for resources in densely populated fields so that the effect of middens are not additive. Maybe that statement could be modified maybe to "Midden soils are significant contributors of agricultural greenhouse gas production. *L. terrestris* and potentially other anecic earthworms should be carefully considered when designing conservation practices."

REPLY: We agree and added the possibility of non-linear responses of GHG release to the density of middens (P17L33-P18L2). We also now note the potential of other earthworm species having equally important role in controlling the impacts of conservation practices on GHG emissions (P18L4).

COMMENT: I don't think Figure 2 adds anything to the paper and the results could be represented in the text because there really isn't much variation.

REPLY: We agree and removed Figure 2. The min and max values of soil temperature and moisture are now presented in the text (P11L15).

COMMENT: When the authors mention "model" in the figure captions do they mean the statistical model?

REPLY: We modified the figure captions to make it clear that the mean estimates are from the statistical models.

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Please also note the supplement to this comment:
<http://www.biogeosciences-discuss.net/12/C4556/2015/bgd-12-C4556-2015-supplement.pdf>

Interactive comment on Biogeosciences Discuss., 12, 6325, 2015.

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