

Interactive comment on “Global soil nitrous oxide emissions in a dynamic carbon–nitrogen model” by Y. Y. Huang and S. Gerber

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This MS presents an extension to an existing model, allowing the simulation of N₂O emissions, which are benchmarked against a newly compiled data set of observed emissions.

I suggest that this work is not yet ready for publication. More work to evaluate and improve the model is required before final publication. When it is finally published, more information should be provided about how the modelled N cycle works, as the basic principles are not clear from this description.

Generally we might expect a publication describing a model to represent an advance in knowledge over the current state of the art. It is not clear to me how this manuscript

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does so. As one referee (Beni Stocker) has pointed out already, one would reasonably expect to see independent evaluation of various quantities that underlie the process of N₂O emission, but this is not provided. The new data compilation, oddly and without explanation, contains only about a quarter of the N₂O emissions data previously compiled by Xu-Ri et al. (2012). And when the data-model comparison is made (in Figure 3), the goodness of fit appears to be inferior to that achieved by the model of Xu-Ri et al. (2012). Xu-Ri et al. (2012) also performed a series of sensitivity experiments that showed consistency with a wide range of published experimental findings.

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