

Interactive comment on “Long-term elevation of temperature affects organic N turnover and associated N₂O emissions in a permanent grassland soil” by A. B. Jansen-Willems et al.

Anonymous Referee #1

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The overall quality of the discussion paper is good; it is nicely written and easy to follow. The authors set the picture nicely in the introduction where they provide a very good overview of the current literature. Their interesting study contributes to the field. The hypotheses, methods and conclusions appear sound to me. (However, it should be mentioned that modelling is not really my expertise; I am more qualified to evaluate the practical work component.) I found the approach very interesting, but I thought a little bit more experimental detail should be provided. Scientific questions/issues: In my opinion the authors nicely combined field/lab work and modelling, however, when I read through the article at first I was a bit confused about the modeling component, because I found it presented as an “add on”. I think it could be a bit more put forward

C1

in the abstract already (e.g. in line 17: “To evaluate [...] an incubation experiment and modelling approaches were combined.” And then further present the incubation and the modeling.) Also I would have liked to be provided with more detail on the calculation of N₂O fluxes (which factors were taken into account for the calculation, which equations were used?) in the “Material and method”-section. Moreover, I would be interested in a little bit more detail on the IRMS analysis (e.g.: how were samples returned to ambient pressure?, what was the precision of your IRMS analyser?, how were δ -values defined?) My last specific comment refers to figure 4. Maybe it’s just me but I did not really get figure 4. In the figure caption it says: “Modelled vs measured data”, but, to me it seems like either modeled or measured data is presented. I would be very grateful for an explanation. Listing of technical corrections: Line 48: one bracket too much before “Niboyet et al.” Line 96: “2” in “N₂O” should be indexed Line 132: space character is missing between “...effect)” and “are” Line 137: I think it should be “In the morning of May...”, instead of “on the morning” Line 137 & 150: Maybe the exact dates are not relevant? Line 329-332: I thought the sentence was quite complicated; the authors might consider splitting it up? Line 407: I think there is a comma missing between “soil” and “which” Line 426 & 429: The sentence was a bit hard to read; maybe it could be split up? Line 460: “still not yet” appeared to me like an odd expression; shouldn’t it either be “still not” or “not yet”? Line 473: “.” is missing after “fungi” Line 483: Shouldn’t it be “Emissions of N₂O [...] were decreased [...]”, rather than “was decreased”? Line 704: I was wondering if a space character was missing between “#” and “shows”. Line 716: Same here, I think a space character is missing between “*” and “Significantly”

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C2