

Biogeosciences Discuss., author comment AC2
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Reply on EC1

Laura Sereni et al.

Author comment on "To what extent can soil moisture and soil Cu contamination stresses affect nitrous species emissions? Estimation through calibration of a nitrification–denitrification model" by Laura Sereni et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-265-AC2>, 2022

R2 Line 19: "assess" the effect? Also should be "extent" in the title

R2 L. 32: in general R2 is not sufficient for assessing model performance, as it doesn't say anything about bias (but I see lines 288-289, which are better, thanks)

R2 L. 53: "biogeochemical models"?

R2 L. 68: Lado 2008 is about European soils — a very different thing than global soils, which is the scale of ESMs

Response: Thank you for your remarks. We corrected the vocabulary mistakes in the text. Considering the Lado reference, we first cited this reference because the JRC constructed very precise databases of European soil heavy metal concentrations that may be easily used by ESMs. However, in accordance with your remark, we added a worldwide reference with the FAO report on soil pollution state.

R2: is there a control (no Cu addition)? Unclear

Response: Indeed, we had a control treatment. To gain clarity, we now have written in the text at lines l.133 the explanation of the existence of a control with only 12 mgCu.kg⁻¹ corresponding to the natural geochemical background that's now reads: "final soil [Cu] of 62, 112, 262, 512, 762, 1012 and 2012 mg Cu.kg soil⁻¹ and control with 12 mgCu.kg⁻¹"

R2 l. 235: Please specify versions of all R packages used, in addition to the R

version. Also, maybe time to update the latter!

Response: The version for gap (v.1.2.2) have been specified l.239 and this of R version was specified l.254

R2 l. 280: what is the timestep of the DNDC version used?

Response: The time step of the DNDC version used was 30 min. We now specify it at line 223.

R2 L. 285: were data randomly separated into parameterization and validation datasets? This is a crucial and unclear point

Response: We didn't have enough data to separate the dataset between parametrization and calibration sets. This is now clearly written at line 235 and 243 with "The dose-response curves of PNA during the bioassay to Cu gradient were plotted and tested with linear, quadratic or cubic functions as fitting models" and "The fits between the model and the data of soil nitrate concentration during the bioassays"

- 288-289: would be good to test and report whether these slope values are significantly different from 1.0, and whether the intercept is different from zero

Response: Considering your remarks, we added the uncertainties around slopes 1:1 in their descriptions lines 308,309,312,313 (slopes significantly different from 1:1).

R2 L. 449-465: most of this is simply restating the results and should be removed

Response: We simplified the conclusions considering this remark and remove experiments description (previously l. 452-455) and NH₄ emissions description (previously l. 459). We only kept few sentences (at lines previously 449-453, 454-456, 459-474). to recall the main results

R2: Fig.2 is the x axis logarithmic? It makes reading and interpreting the graphs difficult

Response: For all graphs, we plotted the x-axis in log representation for a better representation of the Cu gradient The two figures attached represent the nitrous emissions (first figure) and soil nitrate concentration (Fig Rep 2) without (left panel) and with (right panel) log representations. If you prefer the representation without, we can modify all Figures.

R2: Figure 3: please show 1:1 lines

Response: The 1:1 lines were already represented but not in the legend, so we added it to the legend. This now reads: "**Fig 3:** Comparison of modeled against measured soil [nitrate] incubated in different moisture with 1:1 line"

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2021-265/bg-2021-265-AC2-supplement.pdf>