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Biogeosciences Discussions

Interactive comment on "Spatial variations of nitrogen trace gas emissions from tropical mountain forests in Nyungwe, Rwanda" *by* N. Gharahi Ghehi et al.

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The paper adds data on soil N2O production potential over a large spatial scale in a severely under sampled area in the world. As such, I think this paper merits publication.

However, the authors are overreaching with their assumption that lab measured fluxes are representative of field measured fluxes. Even though the authors cite some papers that have found there was little difference in fluxes for field sites vs. lab incubations. A recent paper, indicates that soil nitrogen cycling will change significantly when soils are removed from their natural setting to the laboratory and analyzed after cold storage (e.g. Arnold et al. 2010), the same holds for enzyme activity and microbial biomass

after incubation of air-died soil. Furthermore, not using intact soil cores, removes the lab results one more step from reality. The authors should at least have collected soil gas fluxes during their sampling time, stored the collected fluxes in glass flasks for transport back to the lab. In this manner, they would have had soil fluxes to compare their soil incubation results to. In the short comments, I have made suggestions to change the discussion language to reduce the chance that readers confuse the present data with field based observations

The authors did a great job addressing the concerns raised during the first review of the paper, and present a more balanced discussion based on the measured co-variates.

In their response to the other reviewer's comments they indicate that they plan to go back to the field sites to sample again. I suggest that the authors collect field fluxes, monitor the soil chemical and physical parameters when they measure the field fluxes, so that they can compare field and lab fluxes, and that they collect samples to measure the abiotic N2O flux contribution.

Short comments: Page 11634 line 6, twice has the word 'available'; Page 11634 line 11, the word dataset should be plural; Page 11634 line 21, Davidson 1993 not in the references; Page 11639 line 18, remove extra punctuation after WFPS; Page 11642 line 23, Start with 'The N2O emission rates we measured during lab incubations on soils from the Nyangwe forest'; Page 11642 line 26, 'soil' in stead of 'forest'; Page 11643 line 6, 'soil emissions' in stead of 'fluxes'; Page 11643 line 14, switch emission and published to read 'published emission'; Page 11643 line 15, change 'the observed variability of N2O emission rate at the Nyungwe forest' to 'the observed variability of incubation N2O emission rate from the Nyungwe forest soils'; Page 11643 line 21, insert 'incubation' before 'fluxes'; Page 11643 line 22, as Page 11642 line 23; Page 11643 line 27, as Page 11642 line 26; Page 11646 line 14, remove comma.

Sincerely,

Joost van Haren

Interactive comment on Biogeosciences Discuss., 8, 11631, 2011.