

Interactive comment on “Soil nitrogen transformation responses to seasonal precipitation changes are regulated by changes in functional microbial abundance in a subtropical forest” by Jie Chen et al.

Anonymous Referee #3

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The manuscript bg-2017-3 reported soil N transformation rates in relate to soil properties and microbial functional gene abundance in a rainfall-manipulation experiment in a subtropical forest. The authors showed that the rainfall manipulation (dry-season reduction and wet-season addition) increased NO₃- leaching and had minor effect on N₂O emission, which can be linked to changes in soil properties and specific microbial functional genes (by SEM). This topic is very relevant to Biogeosciences, and the results are robust based on solid data (monitoring of soil properties, in situ N transformation rate measurements, and microbial functional gene measurements). I have few suggestions for the authors to consider in revision.

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1. To be more accurate, DOC is EOC (extractable organic carbon).
2. The writing should be improved for clarity and readability. In some sections, it is wordy and not easy to follow the logic.
3. Microbial functional gene abundance has limited power in explaining the N transformation rates: a) many genes are involved in a process, and b) a gene is there does not mean it is expressed or “functioning”. This needs to be mentioned.
4. L397-402: Why select these 8 plots for the experiment? The initial differences in stand characteristics between treatments should be minimized for such experiment.
5. Figure 1 and 5: why soil pH was not included in the SEM? Was it measured?
6. Figure 2: Why rainfall addition in the wet season did not lead to expected increase in soil water content, in both years? Also, MBC was not significantly affected by the rainfall treatment even in the dry season, which is unexpected. Do you have continuous measurement of soil moisture (by TDR or Decagon sensors) in these 8 plots?
7. Table S2: stand characteristics (species composition, stem density, tree height, basal area, etc.) should be included.

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