

Interactive comment on “Changes in soil carbon and nutrients following six years of litter removal and addition in a tropical semi-evergreen rain forest” by Edmund Vincent John Tanner et al.

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General comments

Tanner and co-authors present an interesting analysis on the changes in soil chemistry following a large-scale litter manipulation in a tropical rain forest. They nicely contextualize their results with findings from other studies while clearly and concisely describing their findings. The manuscript makes an important contribution to our understanding of potential soil biogeochemical response to changes in plant litterfall, and with minor changes and clarifications the manuscript should be acceptable for publication in Biogeosciences.

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Specific comments

It may be appropriate to express changes in soil C stocks as a function of soil mineral mass, but a description of how this was measured is missing from the text. Was soil mineral mass measured in each plot, in each treatment, or in a single pit (like bulk density)?

More broadly, the emphasis placed on soil mineral mass to extrapolate findings seems somewhat surprising, and I'd suspect it's driven by either a lack of appropriate bulk density data for scaling, or non-significant results when using the available data. Either way I'm not asking the authors to go out and take more measurements, but would appreciate greater transparency to understand their decision to focus on soil mineral mass. If data are available to make an extrapolation of Fig 3 with depth on the X axis it would be much more valuable for studies trying to quantify or model changes in soil C stocks, as information about mineral mass is typically lacking or not considered.

I recall publications from some of the temperate DIRT plots (e.g., Lajtha references in the paper) showed changes in different soil C fractions. I assume similar data are not available for this study, but I wonder if consideration of C stabilization mechanisms and soil mineralogical conditions could help explain some of the differences between temperate and tropical sites. Is it worth a brief discussion on this point (e.g. expanding / developing the paragraph that begins on line 202)?

The authors (justifiably) seem keen on their soil P results, which are interesting and relevant (line 262). Is it possible to extrapolate findings for P, similar to the soil C figure 3, making this a multi-panel figure? I think this would illustrate the conclusion that experimental manipulations modify soil nutrient cycles in (perhaps) unexpected ways.

The discussion starts of with the introduction of new results. I appreciate the authors wanting to focus readers' attention on these findings, but feel like results (Figs 3 & 4) are best introduced in the results, not discussion section of a paper.

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Finally, calling out the small plots from the Costa Rican study seems a bit unjustified in a single paragraph subsection of the discussion. Granted the authors make a good point about the appropriate size of experimental plots, but I think Leff and co-authors (2012, cited in the paper) acknowledge the limitation of their small plots. If the authors want this section to remain they should more broadly discuss other litter manipulation studies, not just the Costa Rican site.

Technical corrections:

Introduction: specific values for C pools, turnover times, and fractions seem unnecessarily detailed (lines 33, 36). More broadly the introduction reads a bit like a bullet point of disconnected ideas. This is a stylistic concern, not a scientific one.

Throughout, check that abbreviations are defined before they are used in the text (eg. LR and LA line 55, GFP line 251).

Line 66-68, This is unclear P mineralization (0-2 cm) in LR plots met 20% of NPP needs, or the decline in P mineralization would have met this demand?

Line 76. This study looked at net nitrification and should be Wieder et al. 2013 (i before e).

Line 89. Awkward. Forest productivity isn't mitigated, but increases in terrestrial C storage can mitigate atmospheric CO₂ accumulation. Line 210. Awkward, maybe insert 'a' here: In a deciduous forest in MA. . .

Line 307. What is meant by 'polluted' sites? Is this sites receiving large amounts of N, P or micronutrient deposition (is the later actually a real a thing)? Is this just to say that litter manipulations aren't identical to CO₂ enrichment alone, because they also serve as nutrient manipulations that modify ecosystem dynamics?

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