

Biogeosciences Discuss. of Tanner et al. "Changes in soil carbon and nutrients"

Author responses to reviewer 2

Comment "I would appreciate seeing a comparison of results using more traditional ways of measuring soil C (e.g., fraction of dry mass) and the approach utilized here. Given its novelty, mineral mass is of limited utility when comparing to other studies."

Response

Tanner did a quick calculation (using the data in the supplementary material) of the changes in concentration over the top 20 cm of soil. Litter removal soil shows a 1.9% fall in concentration and litter addition a 2.0% increase in C concentration. This compares with 1% per year using the 'new' calculation based on the same amount of mineral matter. We could put a sentence about this into a revised ms. E.g. "The increases in soil C in our litter addition plots (c. 1% per year, of total C to c. 20 cm depth)"; this is about half of the change calculated using fixed depths and % carbon concentrations (2% per year). "Our changes are much smaller.."

Comment

Technical comments: Please clarify abbreviations: The LA and LR

Response. LA and LR now written out in full everywhere. L- and L+ now changed to litter removal and litter addition.

Comment

The sentence that begins on line 75 is awkward - perhaps a better way of saying this is that "After 2.5 years of litter manipulation in Costa Rica, surface soils (0-10 cm) had lower nitrification in both litter removal and addition treatments..."

Response

We ask to keep our original wording. We deliberately put "In Cost Rica" first in the sentence to mark the fact that we are moving on in the discussion from Panama to Costa Rica. If we start with "After 2.5 years of litter manipulation" it could be taken to mean that we are still discussing Panama.

Comment

"On line 89, the carbon that stays in soil and litter crop does not mitigate increased forest productivity"

Response.

I could not find this. Anyway, in our revised ms we use 'mitigate' only once

"The increase in C in the mineral soil and the litter standing crop following litter addition was statistically significant in the top 20 cm of the soil, suggesting that any increased litterfall as a result of increased atmospheric CO<sub>2</sub> and/or temperature could result in a substantial increase in soil C and therefore partially mitigate the increase in atmospheric CO<sub>2</sub>."

Comment

I appreciated the improvements to the figures in response to previous comments. The figures could be strengthened by including notations to depict which litter effects were significantly different from controls. While this information is largely contained in the text, including this in the figures would help if the images were ever reproduced for other uses.

Response.

With Figs 2 & 2 we plot means and confidence errors if errors don't overlap means are usually significantly different; we say which are significant in the text. Also we make comparisons between litter removal and litter addition, as well as between each treatment and control, showing both types of comparison on the figure might clutter up the diagrams, but if the Editor thinks it useful we will do it.