Biogeosciences

Discussions

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Interactive comment on "Soil carbon, nitrogen and phosphorus stoichiometry (C : N : P) in relation to conifer species productivity and nutrition across British Columbia perhumid rainforests" *by* John Marty Kranabetter et al.

Anonymous Referee #2

Received and published: 11 November 2019

This study deals with soil carbon, nitrogen and phosphorus in relation to foliage element contents and stand productivity at seven forest sites in British Columbia. The study is based on a 52-years old planting experiment, which allows comparison of the sites (and excludes stand age, etc. as confounding factor). The study contains some interesting data and findings. However, I think that some analyses are not correct and some other analyses probably miss out the underlying relationships between the measured variables.

The study is largely based on correlations analyses. In particular, the authors corre-

lated element contents and element ratios (Table 2 and Figure 2). This is problematic in most cases because one precondition of a correlation analysis is that the variables are independent. By definition the C:N ratio is not independent of the C content, thus the pre-condition of independence is not fulfilled. Therefore, the two variables should not be correlated.

One asset of the dataset is that the authors have collected data on stand productivity. This kind of information is many times not available in datasets on soil nutrient dynamics in forests and the authors should make better use of this data. The authors found negative correlations between the stand basal area and the soil C:N ratio which is interesting. However, to explain the observed pattern it would very likely be more meaningful to look at the relationship between soil N stocks and productivity. I recommend to not only consider the element ratios but to calculate the element stocks. The element stocks are likely also useful in explaining the foliage element contents.

The results shown in Fig 3 are interesting. It would be helpful to see the 1:1 line in all three plots. The authors should discuss the question why the difference in the C:N ratio between organic horizon and mineral soil is smaller than the difference in the C:P ratio.

In conclusion, I think that the manuscript contains interesting data that is worth publishing but the data analyses and discussion of the results need more work.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2019-401, 2019.