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Biogeosciences Discussions

Interactive comment on "A cost-efficient method to assess carbon stocks in tropical peat soil" *by* M. W. Warren et al.

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This is a straightforward study on the relationship between peat bulk density and soil carbon contents. Its elegance lies in its simplicity. My only substantial concern is the statistical treatment of the data. The authors present interesting linear regressions that show good predictive capability for soils with >40% organic C. However the data appear heteroskedastistic and I wonder why the authors did not transform the data to address this problem. With the average carbon content of peat being 48%, if regressions are only good to 40%, then the relationship quickly falls apart once there is a small quantity of inorganic matter. Logarithmic transformations should allow the authors to extend the relationship until texture of the mineral fractions becomes a more significant determinant.

Specific comments:

Abstract: I would include the average BD in the abstract. This is a very useful finding of this study as well.

Introduction

Line 47: change 'stock' to 'store'

Lines 65 – 68: I suggest you drop the numbers after the decimal points; I don't think those numbers are that precise.

Line 128: Is this analysis only valid for forested sites, or can these relationships be applied to agricultural sites and plantations? If this is indeed only valid for forests, a next interesting step would be to try some of these relationships on other land uses and see if they are good predictors. You might try that here, or consider it for a future paper.

Methods Line 133-136: This sentence can be cleaned up a bit.

Lines 139-177: I thought there were novel data from Micronesia (line 131). These are not described here.

Line 145 and 153: What are central transects? Central to what?

Lines 158 and 163: It looks like each lab dries the samples to different levels. Why the difference? Does this affect the relationship?

Lines 190-191: These relationships are not shown in the paper. It would be useful to see some plots of residuals.

Results: Lines 204 and 225: Please provide P values for your equations.

Line 225: It would be useful to see a plot of residuals of a linear equation and of a log transformed equation.

Discussion Line 259: Actually your finding on peat BD should be a bit more prominent

in the results section and compared here. This result suggests that IPCC or others are making a 30% error just on BD alone.

Figures Make sure your figure legends correspond to the guidance of the journal. They hold a lot of information that might be better presented in the text.

Figure 1: There is really no point to including Figure 1A. I would suggest you include 1C, but remove the regression lines as the point can be made without them. Consider whether a log transformation makes sense. You could then have a plot with only literature values with your first regression and then plot Figure 2 as panel C.

New figure: I would really like to see a plot of residuals (or predicted vs. actual, with a 1:1 line) for whatever equation(s) you settle on.

Figure 3: Where does this come from? There is no reference to the figure in the text, no mention in the methods that you will use the new equation to assess C stocks. This looks like a plot of your novel data. Where are the Micronesia sites? What might be useful is a graph of the relationship between peat depth and C stock, with the points representing the different sites identified.

Interactive comment on Biogeosciences Discuss., 9, 7049, 2012.