

Interactive comment on “An analysis of forest biomass sampling strategies across scales” by Jessica Hetzer et al.

Anonymous Referee #3

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This manuscript details an interesting and novel approach to estimating forest biomass using a dispersed cluster of forest inventory plots. However, in a way this is a “big data” solution to a problem where the solution does not necessarily consider all the variables necessary to making appropriate and constrained biomass estimates. Forest inventory plots are often chosen based on a wide variety of information including forest, soils, hydrology, topography, climate, etc. and are often not randomly chosen. The classical approach of positioning plots in strategic, representative areas often provides constrained and informed estimates of biomass. That said, now that we have huge amounts of remotely sensed data we can apply “big data” approaches to test the extents and limits of many ecological methodologies. I think that is the advantage of this manuscript that it explores this space and does so in an interesting and informative

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way.

I am honestly torn on whether Amazonia is a perfect test or worst-case scenario for his methodology. Thinking through this, diversity is incredibly high and there are subset forest types within Amazonia. . .some that rely heavily on topography/climate such as cloud forests, while there are also dry forests, seasonally flooded forests, and also wet forests. But again, this wide variability may actually be a strength of this approach. I would like to see if compared to temperate forests regions in N. America and Europe as well as boreal areas across the higher latitudes. It would be an interesting comparison to see if those systems diverge wildly from Amazonia.

My specific comments follow, but I think this paper has a lot of potential to drive how we think through sampling and forest inventory methodology. I applaud the creativity of the researchers.

Numbers indicates line nos.

14-16: 25 ha is a lot of forest to inventory. I am already thinking of the sheer amount of folks I have to hire.

26: Define vegetation specifically as aboveground biomass

28: Qualify aboveground C

45: These units seem wrong. Also, this is an older citation and only one citation given for what you indicate is a widely varying range.

30-55: In general good content, but the case needs to be made why uncertainties in rain forests are potentially higher than other forests. That would add to this section.

Figure 1 : Maybe flip the scale.

Figure 3: What do you mean by accurate here?

* A point. . .many inventory plots on the ground are circular, but I don't see specifically

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(unless I have missed it) but are you using circular or square estimation here? There are some deep literature that may be consulted here about the differences

Lindsey, A. A., Barton Jr, J. D., & Miles, S. R. (1958). Field efficiencies of forest sampling methods. *Ecology*, 428-444.

228-232: These section could be revisited to ensure clarity in how the results are framed.

234 – What do you mean by sampling effort increase w/ smaller sample size?

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-277>, 2019.

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