

Reviewer 2

The paper "A question of scale: modeling biomass, gain and mortality distributions of a tropical forest" is an attempt to explore the relationship of forest dynamic main characteristics i.e. biomass stock, biomass growth and mortality, across spatial scales between 10m to 100m. The authors used different approaches based on multi-scale observation sources and they estimated scale factors to upscale or downscale the distribution of the forest dynamic characteristics. In addition, the authors make use of stochastic simulation forest models in order to retrieve the observed distributions of each scale based only on one of them with success.

This study is overall well crafted and the material and method is particularly well written with clear statements that will help readers to reuse their works in different forest ecosystems across the globe. Nonetheless, the limited range of scales that they really used in the study (10m – 100m instead of the full range 10m-500m) reduced the impact of the study.

Thank you for reviewing our manuscript and for the valuable feedback. In the following, we will address all your points.

I have few general comments :

- The introduction is somewhat difficult to follow because it looks like an enumeration of facts without any logical link helping the reader to follow the thinking of the authors. I would recommend using more linking words to structure the introduction and especially the first paragraph.

Thank you for this comment. We will include the recommended linkages between the paragraphs.

- The overall method is clear but why the authors didn't use higher scaling factors such as 200m, 500m and 1000m ? The lidar survey gives the authors a way to validate them, isn't it ? If I understand well, one can extrapolate (even if the lidar approach shows divergence) upscale distributions from the log/log scaling relationship for G and M. If not, the authors must justify their choice in section 2.3.

Thank you. We have chosen to focus on the scales between 10 and 100 m as we consider the frequency distributions between these scales being primarily demography driven, while at larger scales they are driven by environmental gradients at landscape scale. The lidar analysis shows the deviation of the scaling relationship, but it also shows how quickly even the whole island becomes too small to obtain enough data records for analysis. These landscape gradients were however not represented in the model. When we applied the model at scales coarser than 100 m we obtained increasingly narrow, and increasingly normally distributed biomass distributions which further follow the scaling relationship. But since this is not what we observe in real landscapes, we did not consider it valuable to show model results beyond the 100-m scale. We will add the explanation in section 2.3.

- In the result section, again, I found the figure 4 a bit disturbing since most of the study relates on a range of scale between 10m to 100m e.g. scaling factors are calculated for 10m, 20m, 50m and 100m. Modeling section is also made between 10m to 100m. I would recommend choosing between including the larger range in both modeling and scaling factor sections (which may lead to less clear results but will increase the paper's impact) or put the lidar analysis in supplementary material in order to clearer the message (but decrease the paper's impact).

Thank you for these suggestions. We have decided for the second option to move Fig. 4 to the supplements, as we have explained above, that the analysis of the effect of landscape gradients on scaling was beyond this study and not included in the model. The lidar analysis was meant as a first step towards looking beyond the 100-m scale, but we think modelling landscape heterogeneity would be a topic for another study.

- The discussion about the technical aspect is good but, at line 365, the sentence about the issue on the weak performance of simulations using 100-m reference gives no information at all on what would be the cause of this issue. Discussion is exactly the place where the authors can give their thoughts about it. So please, share with the readers otherwise it feels like the authors want to hide something.

Thank you. We will add text about what we think the cause might be.

- We wait for this section to lighten us on how the author's work will benefit others (modelers colleges but also no-modelers). I found the section a bit vague without practical examples. I also would like to read a perspective section in which the reader will know more about what the authors are planning in order to solve issues regarding the weaknesses they found during their study.

Thank you. We will add a perspective section.