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Response to Reviewer 2

The paper is very well written, it cites the proper literature and follows previous papers methodologies. Authors perform an extensive field campaign effort to collect the gap data, which is very laborious and I congratulate the authors. The study analysis relies on 18 gaps being detected during 2 years on a 600 by 300 m area from both field and UAV data combined for their analyses. From those gaps, a total of 14 were detected by both approaches. My main concern is about the scale of the study and the sample size of gaps analyzed is too small (n=18?) in order to attack any of the four objectives proposed in the study. Thus, we cannot be sure if the results are indeed valid. See below two comments:

We thank the Reviewer 2 for carefully revising our manuscript. We will consider all questions and comments to preparing our revised manuscript. Please, find below a point-by-point answer to all questions.

We believe there was a misunderstanding regarding the number of gaps used to address our research questions. The 18 gaps were only used to address the first question regarding the comparison of the two methods of detection (i.e., remote vs. field). To address the other questions, we used all gaps identified within the monitored period (32 in total). We will edit the text for clarification and improve the discussion on the limitations of our study. As argued on our answer to the Reviewer 1, we will also highlight the importance of conducting similar assessments in regions with different forest structure and disturbance regime.

I don't fully agree with the first section title "Imagery and field data have different sensitivity for detecting small gaps". If you tell me a method finds 14 out of 18, that is, 77.77% accuracy, that is an excellent agreement and not exactly what the sub-section title suggests. However, the sample size is too small, if you detect or not an additional gap that changes by 5% the accuracy.

We agree with Reviewer 2 and will change the title of this sub-section. Indeed ~78% accuracy is an excellent agreement. The point we wanted to make is that the mismatch between the methods was mainly caused by relatively small gaps restricted to the upper canopy, which were consistently not detected in the field. As previously pointed, we will also improve the discussion on the limitation of our results.

The scale analyzed does not allow to state that "UAV photogrammetry is a robust method for monitoring gap dynamics in Amazon forests". That may be a great step towards validating the detection of gaps in the field – which is a really challenging activity. However, the limitations of scale were not stressed out in Discussion. The method should be tested on larger scales before saying the method is robust. One suggestion would be to use airborne LiDAR as a reference for detection of the gaps, then using the UAV on top of it and this way gaining a lot of scale. Ducke forest nearby Manaus could be a great candidate for a future experiment. It already has a few airborne lidar flight lines in the past, and if more

are collected, together with the UAV data, this could help a lot to couple with the UAV data.

The goal of our study was to evaluate the accuracy of UAV imagery using field data collected simultaneously, to describe mechanisms of gap formation and to quantify associated losses of biomass. To our knowledge, such assessment has not yet been conducted for Amazon.

However, we agree that the limitations due to the scale of the study shall be better discussed. We will include a discussion on the complementarity of UAV photogrammetry and LiDAR. This complementarity stresses the potential of UAV photogrammetry, which has a relatively low cost, is simpler to process and thus can be repeated in other regions of interest. As the Reviewer 2 commented, future studies may expand the existing knowledge on the size distribution and dynamics of gaps by combining sensors with different resolution. When combined with LiDAR and satellite, UAV imagery can be used to address patterns of gap formation and recovery at the landscape level.