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Interactive comment on "Forest aboveground biomass stock and resilience in a tropical landscape of Thailand" *by* Nidhi Jha et al.

Anonymous Referee #2

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This study combines field, airborne (Lidar) and satellite (Landsat) data to estimate biomass stocks and accumulation in a regenerating tropical forest in Thailand. The authors use multi-temporal Landsat images to identify and target pixels that went from "non forest" to "forest" since 1972. They estimate the rate of biomass gain of these pixels by regressing the recovering time and biomass estimations from a locally calibrated AGB model. Their approach is a clever and effective way to assess biomass dynamics in the absence of multi-temporal biomass maps, and will probably encourage similar future studies in other areas. Recovery from forest disturbance is an important but still poorly understood topic, and this study will definitely contribute to advancing this field. The paper is very well-written, clear and well organized. The methodology is on point and the authors use high quality validation methods, making the whole study very ro-

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Discussion paper

bust. All the methods used in this study have already been used in various studies, but the way the authors combine them is unique. The paper could be improved by making some minor changes presented below.

General comments:

- My main concern is that only 3 plots with biomass <100Mg/Ha were used to make the AGB lidar model. This is an important point, since the study is focusing on low biomass/recovering areas. This should at the very least be addressed in the Discussion. - Although I understand why the authors chose to focus on pixels that went from “non-forest” to “forest", I think it would be nice to also talk about the pixels that remained “non-forest”. There is no information on these in the paper, as the authors are not making any distinction between the “non-changing” pixels (pixels that remained non-forest vs. pixels that remained forest). I think it would be very informative to see how much of the degraded pixels did not recover since 1972 (excluding roads). It would give a more complete picture of the state of the forest. Ignoring these pixels implies that all disturbed areas have recovered. It would be nice to mention this somewhere in the manuscript, and also perhaps making this distinction in Figure 4.

Specific comments:

- L.89: How long before? Is there any historical information indicating when it started? - L.111: “SIS; n=3”. This low number should be addressed in the discussion. - L.114: If SES forest is 35-40 years old and OGS forest is more than 200 years old, what is in between? - L.160: “(see below)”. Replace by “see Table S1”? - L.199-200: address “pixels that remained non-forest” (see General comment number 1) - L.206-208: This part of the methodology should be explained in more details, or differently. I wasn’t sure what you meant until I saw Figure 5. - L.225: separate the pixels that stayed non forest and those that stayed forest - L.228: Do we know why? Is this addressed somewhere? - L.233: Why only eight? Mention Figure S4? - L.270-271: If the rate of accumulation is increasing, shouldn’t the rate over 40 years be higher than the one over 20 years?

Figures:

Figure 1: add “(TCH)” in caption Figure 4: add grey classes to legend Suggestion: Make distinction between “pixels that remained forest” and “pixels that remained non-forest”

Supporting information: Table S1: Highlight the results of TCH and mention in caption that it is the best metric. Table S2: Keep same name conventions as in TableS1. Are these the best 4 models? Figure S1: It would be nice to add the sub classes I mentioned about Figure 4, if possible. Figure S2: Compare the histogram presented in Figure 3 to this one.

Also, it would be nice to have some results from the random forest analysis somewhere in the Supporting Information, and add that reference in the main text.

Minor comments:

- L.36: Replace “The previous study” by “A recent study” - L.98: “which the plot officially joined”: please rephrase - L.122: Replace “into the ground” by “into ground” - L.138: Replace “cannot” by “could not” - L.211: For consistency, keep the order you present forest classes the same throughout the paper (SIS, SES, OGS)

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