

We deeply thank the two reviewers for their time and helpful, important comments. Below is our point-to-point response to each comment.

Anonymous Referee #2

In this manuscript the authors simulate hypothetical deforestation scenarios with an intermediate complexity Earth system model. They then investigate the resulting temperature changes and the mechanisms that cause these, all with a special focus on the latitudinal dependencies. The authors use fixed SST and CO₂ contents from 1960..1990.

Overall I find the paper worthwhile and a nice contribution to climate sciences. I would have preferred a more thorough discussion of the state of the art of this topic, and also a little bit more contrasting of the results to other studies. On the second point: The authors explain convincingly, why they can't do this, though. I like the idea of disentangling the various contributions to the overall temperature change effect. The manuscript doesn't provide anything groundbreaking new, but nicely quantifies the basic assumptions given. Also, the model, its shortcomings and how they might affect the outcome are discussed well. I particularly like the analysis done for Fig 5. Overall, I don't see anything that needs major revising.

There are a few minor gripes, mainly with the form, though. On p1904,11 a map with potential vegetation is mentioned, but I cannot find it.

Sorry, this figure can be found in supplementary information.

Also I think a native speaker should double-check the manuscript. The use of articles and prepositions is somewhat lacking, examples I found at first sight are p1904,113 -> "the deforestation", p1905,121 ->"of more than", p1906,18 ->"In the tropical", p1907,19 "to the global", p1909,12 ->"by an increase", p1910,19 ->"which the relative", p1910,124 ->"is a tendency" p1914,17 ->"The albedo effect", p1969,11 ->"of the climate", p1916,12 ->"on the surface", p1916,14 ->"of the complex" or ->"of a complex".

Furthermore, I suppose on p1908,116 you meant "change show linearity", and I'd drop the p1910,114 "On the contrary" -> "whereas", or such, since there is no contradiction. Disclaimer: I am not a native English speaker.

Thanks for pointing out those language issues. We have carefully checked the manuscript especially by our co-authors who are native speakers.