

Interactive comment on “Land cover and its transformation in the backward trajectory footprint region of the Amazon Tall Tower Observatory” by Christopher Pöhlker et al.

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Before anything else, I have to declare my lack of detailed knowledge on back-trajectory methods and large-scale meteorology, as well as knowledge on many of the topics discussed in relation to the land surface over which the trajectories pass.

On the whole, this seems an extremely useful contribution to the interpretation of current and future ATTO science. It can potentially serve as a standard reference to most other publications and thus be highly cited.

The methodology to establish the back trajectories seems sound and comprehensive,

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but again, I am not an expert on this. The manuscript provides an analysis of almost everything that happens along these trajectory paths, now and in the projected future.

I do have a few reservations though, and I suggest the authors take some action to address these:

1) The paper is very (overly) long. There are several extensive literature reviews embedded in the analysis that to my taste dig too deep into the backgrounds, which often carry whole science debates with them. E.g., where it concerns deforestation, citations refer to the impact of road building (and not everyone is convinced that roads are the main controls of deforestation); (lack of) seasonality is addressed in relation to the sometimes disputable notion that trees have very deep roots; Amazon 'die-back' is addressed as a potential future impact on the footprint properties, while this phenomenon is highly uncertain. I am sure this also holds for the other issues covered where my knowledge of the field is more limited. This carries the risk of being rather uncontrollable, hard to verify for bias. The manuscript does not set out a clear and rigorous strategy for review, so is not completely suited for the status of review paper. Also, there is no need to discuss the underlying science of these impacts in this manuscript, as it distracts from the main purpose: to serve as a reference for future ATTO science.

I did not strictly check, but it seems to me that even in the 'summary and conclusions' new issues are brought in.

I suggest the authors reduce contents here and limit themselves to merely listing potential issues affecting the trajectory, with limited key references.

2) I wonder how directly useful the presented format will be to future ATTO science. Perhaps the authors can synthesise the range of issues affecting the various classes of BT's in a more systematic way: for each class, provide a map, table or matrix quantifying the impact of the (three or five) MAIN impacts (co-ordinates, future year, impacts (1...5)). This could be more readily be implemented in future analysis of ATTO results.

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For the rest, the MS is well-written and well-documented. Figures are many, and might perhaps also be reduced somewhat, to support a more concise synthesis.

I wish the authors good luck with this extremely useful endeavour.

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