

I have read the revised version of the article, and noted the changes made in response to my review of the previous version. I'm still finding it confusing to read and fully comprehend, however, and therefore recommend more changes be made before publication. Among other things, I am still not understanding the physical mechanism that the authors propose to explain how a surface increase in T_{\max} due to deforestation can produce a cooling at 2m above the surface. Given the focus on differences between ΔT_{surf} and $\Delta T_{2\text{m}}$, this seems to be a major part of the article.

P. 3, Line 20: This may be a style issue, but the acronym MPI-ESM should be spelled out in the introduction, not just in the abstract.

P. 3, line 20: A paragraph should comprise more than one sentence.

P. 4, line 28: Should read '...allows **us** to...'.

P. 5, line 7: 'following' is misspelled.

P. 5, line 5/6: Using ' T_{atm} ' and 'atmospheric temperature' interchangeably is confusing, as is using ' $T_{2\text{m}}$ ', 'air temperature', and 'near surface temperature'. This is especially true when, for example, the text describes 'near surface temperature' and refers to a figure in which that same variable is now called ' $T_{2\text{m}}$ '. Please change them to be consistent.

P. 6, Eq. 4: s_{atm} is the dry static energy at T_{atm} , right?

P. 9, Line 24: I don't quite understand the sentence 'Part of the difference...'. The responses of T_{surf} and $T_{2\text{m}}$ are different with (Fig. 2) or without (Fig. 1) averaging, so I don't see how averaging could explain the different responses.

P. 9, Line 29: Fig. S2 is for annual mean, and doesn't say anything about daytime or 'lowest atmospheric layer' (that's T_{atm} , correct?). Should this refer to Fig. 2?

P. 9, line 30: 'deforestation further increases surface temperature (Fig. 1)'. Should this refer to Fig. 2?

P. 9: Fig. 2 shows the maps for DJF and JJA, but you don't explain why they look as they do (as is done for T_{\min} and T_{\max}). I'm assuming that the T_{\max}

effect ($\Delta T_{\text{surf}} > 0$, $\Delta T_{2\text{m}} < 0$) demonstrated in Fig. S5b explains the areas where T_{surf} and $T_{2\text{m}}$ are different signs in JJA, while the Tmin effect ($\Delta T_{\text{surf}} < 0$, $\Delta T_{2\text{m}} < 0$) explains why $T_{2\text{m}}$ and T_{surf} look similar in DJF, correct?

P. 11, line 19: I don't see how Fig. S6 shows what is described in that sentence. MPI-ESM-LR represents a completely different simulation than the one done by the authors with MPI-ESM, and it's hard to make out any details on these plots in any event.

P. 9, Line 31: I am still not satisfied with the explanation of how $T_{2\text{m}}$ can cool for T_{max} while T_{surf} rises. The article again invokes the scheme used to interpolate $T_{2\text{m}}$ using T_{surf} and T_{atm} , but there is still no real explanation as to how in reality an increase in surface heating would not lead to an increase in both vertical mixing and $T_{2\text{m}}$, especially over a distance as small as 2m. Fig. 2 implies that the $\Delta T_{\text{surf}} > 0$, $\Delta T_{2\text{m}} < 0$ effect in the midlatitudes exists for JJA, but the other climate models do not show this (Fig. 3). You refer to the work of Meier et al. as having seen such an effect, but that too was only seen in a model, and they mention that observations contradict this. This is being put forth as a major reason that ΔT_{surf} and $\Delta T_{2\text{m}}$ differ, so I think a better explanation is needed.

Figure S1: I have several questions about this figure:

1. The colored areas represent the potential vegetation from the Pongratz study, correct?
2. Your response to me (#3) seems to imply that forest world was created by simply replacing all current grasslands with forest, and deforested world was created by replacing current forest with grasslands. On page 4, line 8, however, your reference to the Pongratz study implies that a recreation of pre-industrial vegetation was done, which would be something different.
3. What do the dots mean? Are they centers of the grid boxes, or do they have something to do with the $\frac{3}{4}$ deforestation pattern?
4. In the Figure S1 caption: "The 100% forest is replaced by 100% grasslands...". This is only true for 3 of every 4 grid boxes, correct?