

We thank the reviewer for their comments related to the preprint discussion. If we understand correctly, we expect the reviewer may have additional comments for us to address in a full revision at a later stage.

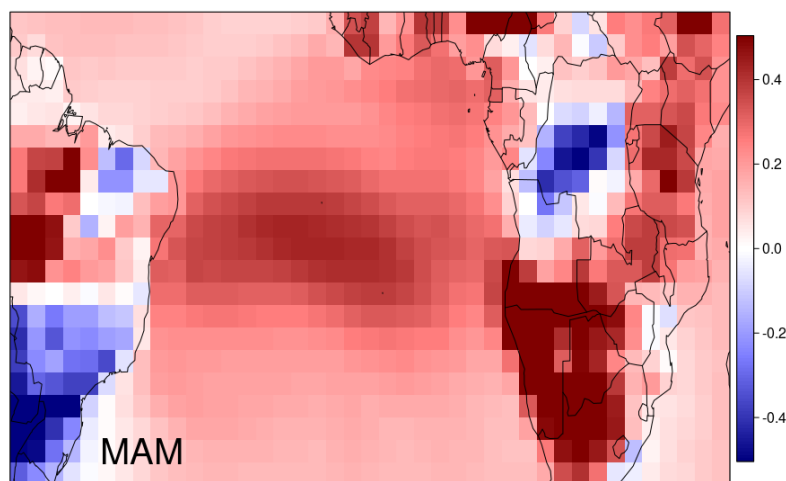
We provide our responses to the quick preprint comments here, and we look forward to any additional comments/suggestions the reviewer may have for a full revision (at which stage we will of course provide a line-by-line response to all the comments in addition to these below).

1) *According to Figure 6, there is ozone change over the Atlantic ocean. Why is that?*

We thank the reviewer for this interesting question. We have checked the boundary layer ozone budget diagnostic over the region, and found that transport processes are largely responsible for the ozone change over the southern Atlantic Ocean. The ozone change in that region is the strongest during MAM (shown in Figure R1 below) and the weakest during JJA.

We note that similar transport may contribute to very small O<sub>3</sub> changes in other parts of the world, but our choice of colorbar in the manuscript purposefully de-emphasizes these exceedingly small effects (< 0.25 ppb) since they would be highly uncertain.

We will include this explanation in our revised manuscript during the full review stage (assuming we understand correctly that the reviewer may have additional comments that we will need to address in a full manuscript revision).



**Figure R1: Changes in MAM mean surface ozone (ppb) over southern Atlantic Ocean and the surrounding regions.**

2) *According to Table 2 and Figure 1. The changes in coverage is not unitless it's in percentage? The figure doesn't seem to be consistent to Table 2.*

We thank the reviewer for pointing out this potential source of confusion.

In Figure 1 our goal is to demonstrate and discuss the spatial pattern of land use and land cover changes. We choose to present the changes in coverage of each individual land type relative to

the area *per individual grid cell* (and as such these fractions are unitless). To clarify, these changes will be identical to percentages within that grid box: For example, a +0.1 “ $\Delta$ Needleleaf Forest” in Figure 1 indicates that needleleaf forests now occupy 10% more of the total grid cell area relative to the baseline.

For Table 2, we are summarizing land use and land cover changes in terms of the *global* total area covered by each land type. The “percentage changes” in column 4 are relative to the global total area covered by each individual land types at 1992.

We realize that we have used “coverage” to refer both the “fraction of area covered by a land type” (caption of Fig. 1) and “total area covered by a land type” (headings of Table 2), and appreciate the reviewer bringing up this source of confusion.

In our revised manuscript, we will change the caption of Figure 1 from (“...characterized by the changes in **coverages** (unitless)...”, line 779) to “...characterized by the changes in grid box **fractional coverages** (unitless)...” for clarification in the revised manuscript. We welcome additional suggestions from the reviewer to further clarify this confusion.

We look forward to any additional comments from the reviewer for a full revision, and will of course provide a line-by-line response to all of their concerns with a fully revised manuscript that includes addressing these quick comments brought up in preprint discussion phase.

Thank you very much for your time,  
Anthony Wong and Jeffrey Geddes