

## Review of Gong et al. 2019

Gong et al. present research using the NASA ModelE2-YIBs model to estimate the impact of ozone damage to vegetation on atmospheric composition. They implement a more detailed representation of ozone damage in a coupled land-atmosphere model and find that, in general, inhibition to stomatal conductance leads to ozone increases. Quantifying biosphere-atmosphere exchange processes such as ozone damage in coupled models is an important line of research, and this work will likely be fit for publication in ACP once the following comments are addressed.

### General Comments

My major concern is with seemingly inconsistent results in various heavily vegetated areas, specifically Africa. In Figure 2, ozone concentrations in central Africa look to be ~48 ppbv in a region with a lot of vegetation. This is higher than ozone in other regions (e.g. North America) that do show ozone damage impacts. However, in Figures 3, 5, 7, and 8, there are no discernable ozone damage impacts shown in this area. Why is that the case? This is surprising and should be explained further in the manuscript.

### Specific Comments

P2 L31: Citation needed for the statement that the majority of ozone deposition is through stomatal pathways.

P3: Despite the text critical of previous work, the authors here find a very similar ultimate impact of ozone damage on vegetation. This should be acknowledged here or elsewhere in the manuscript.

P4: A description of biogenic emissions is necessary in this section.

P6 Eq 10: What are the variables “n” and “i”?

P6 L28: What does “because of the data limit” mean?

P7: The CTRL statement as described here is confusing. The text states that damage is calculated offline using the Sitch et al. (2007) scheme, but Table 1. states “None”. Which is it?

P7 L30: The linear fit in Figure 7d indicates an absolute bias of 32 ppbv. This should be acknowledged in the text as a limitation of this modeling approach.

P9 L 10: If the justification for focusing on northern hemispheric summer is that absolute changes to IPE are most significant during this time, why not show this in a figure instead of merely suggesting it?

P10 L10: The authors speculate that the changes are no due to IPE changes, but instead meteorology. This should be explained further in more detail or stated more clearly as speculation.

P11 L22: “likely related to the increased temperature...” further speculation. The sensitivity of the simulated ozone to temperature is not disentangled from other confounding factors. This should either be explicitly done, or the statement softened.