

Biogeosciences Discuss., referee comment RC2
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Comment on bg-2021-125

Anonymous Referee #2

Referee comment on "Ozone-induced gross primary productivity reductions over European forests inferred from satellite observations" by Jasdeep Singh Anand et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-125-RC2>, 2021

The paper is well-written, and of great interest. I suggest minor comments.

L7: to be reformulated e.g., "soil moisture is a significant variable governing/affecting ozone uptake leading to GPP changes...", indeed soil moisture do not directly govern GPP reductions.

L46: ozone levels decreased in rural and remote areas while ozone levels are rising in cities following the emission control strategies worldwide.

Section 2.2.1 & 2.2.2: did you use (extrapolate) meteorological and ozone data at canopy height (ca. 20-25 m)? as you used the parameterization of the DO3SE model for sunlit leaves at the top canopy (Table 1).

Table 1: mistake for Tmin for Mediterranean species (Deciduous Tmin = 0; Evergreen Tmin = 1). Explain why Tmax is set at 200°C.

L106-107: to be reformulated, indeed AOD are not considered as precursor species.

L114: why an overestimation of 15% is observed in Southern Europe?

L154 (formula), please check the parenthesis (fmin (fT. fVPD. fSWC))

L167: what is the layer depth for SWC? Soil moisture is usually obtained for the upper 10-20 cm of soil, which resulted in a worst-case risk scenario, as the uppermost soil layers are expected to dry out more easily than deeper layers.

Figure 3: the caption needs to be updated as the first figure (left side) is "Mean f". please check the unit of gsto (usually we use $\text{mmol O}_3 \text{ m}^{-2} \text{ PLA second}^{-1}$).

Section 2: a new section 2.5 is needed with statistical analysis (trend analysis, RFA).

L195: which test did you use for trend analysis: Mann-Kendall test, Sen method?

Figure 8: why some areas are missing (e.g., the UK, Southeastern Spain, Northwestern France)?

Section Discussion: remove Fig. at L245, L262.

L235: do you mean "tropospheric" rather than "anthropogenic"? Surface ozone can be formed from biogenic VOCs.

L236: add references.

L238: previous studies applied CCM and CTM models to investigate surface ozone impacts on vegetation at regional and global scales.

L246 "caused by differences in parameters... vegetation": to be reformulated. It seems that only physiological parameters led to latitudinal gradient in GPP reductions. Differences are also and mainly due to ozone levels, meteorological conditions (more or less optimal for ozone uptake), etc.