

## Authors' response

To gmd-2019-21 editor decision (04 Oct 2019): Thank you for your detailed comments regarding grammar and language. We appreciate these and changed our text accordingly. In the following, we will respond to the questions in detail.

- Page 1, Abstract, line 19: Change “associated to” to “associated with” and change “resistance the ocean” to “resistance over the ocean” Changed accordingly.
- Page 2, Introduction, line 15: Replace “else” with “otherwise” Changed accordingly.
- Page 2, Introduction, line 34: Replace “observation” with “observations” Changed accordingly.
- Page 3, Introduction, line 2: Change “sides” to “sites” Changed accordingly.
- Page 3, Introduction, line 15: Worth noting that those early observations were subject to interference by other species e.g. SO<sub>2</sub> Thank you for pointing this out. We add this remark and write: *These early observations, however, were subject to interference by other species, e.g., SO<sub>2</sub>.*
- Page 3, Introduction, line 27: Worth saying at this stage why the Luhar study gives lower estimates We add: *In particular, Luhar et al. (2018) find that the average surface resistance of ozone over ocean ( $r_c = 2200 \text{ s m}^{-1}$ ) is highly overestimated in most models.* We add to sentence P3L14: *[...] indicates much lower amounts [...] due to lower dry deposition to the oceans.*
- Page 4, Introduction, line 5: Change to “as the beginning and duration of the greening season” Changed accordingly.
- Page 4, Section 2, line 15/16: Change to “publication focussing on this is planned” Changed accordingly.
- Page 4, Section 2, line 17: Change “is given in a” to “is given at a” Changed accordingly.
- Page 7, Section 2.1.3, line 2: Remove “,” after both Changed accordingly.
- Page 7, Section 2.1.3, equation 12: I’m not clear what the index  $m$  is referring to – can you explain or exclude if not necessary? The index  $m$  refers to *molar*. We made this more clear. We add *molar* to the sentence preceding the equation to *[...] the leaf-level molar stomatal conductance in the mOSaic scheme [...]*. And we move the last paragraph up and change it accordingly so that it follows the equation: *The maximum molar stomatal conductance is given by  $g_{\text{max},m}^k$  which is in units of  $\text{mmols}^{-1} \text{ m}^{-2}$ . A unit conversion to  $\text{ms}^{-1}$  is necessary in our model: [...] To annotate the differing units, we use the index  $m$  in Eq. ([...]).*

- Page 7, Section 2.1.3, line 27: Change to “start of the greening” Changed accordingly.
- Page 9, Section 2.1.3, line 3: Change “land surface types k” to “land surface type k” Changed accordingly.
- Page 9, Section 2.1.3, line 4: Change “others” to “other” Changed accordingly.
- Page 10, Section 2.2, line 28: Change “planed” to “planned” Changed accordingly.
- Page 11, Section 2.2.1, line 10: Give web address Changed accordingly.
- Page 12, Section 2.2.1, line 5: Change “planed” to “planned” – Check for other examples Changed accordingly.
- Page 12, Section 2.2.2, line 13: Change to “spectrally” Changed accordingly.
- Page 13, Section 3, line 14: Give reference for CEDS here Changed accordingly.
- Page 13, Section 3, line 17: Can you provide global annual total? ...
- Page 14, Section 3.1, line 13: Change to “we show global distributions of the relative difference between mosaic and wesely\_type for surface ozone, dry deposition velocity and total ozone dry deposition” Changed accordingly.
- Page 14, Section 3.1, line 14: Change “ozone burden” to “surface ozone” Changed accordingly.
- Page 14, Section 3.1, line 16: Change “then” to “than” Changed accordingly.
- Page 15, Section 3.2, line 5: Change to “the multi-model mean of the Task ... models” Changed accordingly.
- Page 16, Section 3.2, line 5: Change to “available” Changed accordingly.
- Page 16, Section 3.2.1, line 7: Change “in consistency with” to “consistent with” Changed accordingly.
- Page 16, Section 3.2.1, line 10: Change to “hemispheres” Changed accordingly.
- Page 16, Section 3.2.1, line 11: Change to “focussing” Changed accordingly.
- Page 16, Section 3.2.1, line 28: Change to “as the new” Changed accordingly.
- Page 16, Section 3.2.1, line 29: Change to “Arctic” Changed accordingly.
- Page 16, Section 3.2.1, line 30: Change to “strong sensitivity to” Changed accordingly.
- Page 17, Section 3.2.1, line 11: Change to “account” Changed accordingly.

- Page 17, Section 3.2.1, line 11: Change to “but do not” Changed accordingly.
- Page 17, Section 3.2.1, line 15: Change to “matches better” Changed accordingly.
- Page 17, Section 3.2.1, line 21: Change to “as a reference” – Also, in section 3.2.2 Changed accordingly.
- Page 19, Section 3.2.2, line 12: Remove “both” Changed accordingly.
- Page 19, Section 3.2.2, line 21: Change “regarding” to “for” Changed accordingly.
- Page 19, Section 3.2.2, line 23: Change “In the case of” Changed accordingly.
- Page 20, Section 3.2.2, line 19: Change to “in the Oslo” Changed accordingly.
- Page 22, Section 3.2.2, line 6: Change “responses” to “responds” Changed accordingly.
- Page 22, Section 3.3, line 16: It is unclear what you mean by “While on global average much more concise with the MACC...” We make our point more clear and change the sentences to: *Regarding the global average surface ozone concentration, Wesely\_type (Supplement S.8) is more consistent with the MACC-reanalysis than mOSaic, but shows the same tendency of enhanced ozone over the continents as the latter. This enhancement is apparent mostly in the deep tropics and over the north-western Indian subcontinent which coincide with regions of high intensity in incoming UV radiation.*
- Page 23, Section 3.4, line 8: Change to “At 4 of the 6 sites” – and again, later on in the same section Changed accordingly.
- Page 25, Section 4, line 4: Correct spelling i.e. “mosaic” Changed accordingly.
- Page 25, Section 4, line 6: Change to “(with the latter” Changed accordingly.
- Page 25, Section 4, line 22: Change to “the operational” Changed accordingly.
- Page 25, Section 4, line 30: Change to “In the case of” Changed accordingly.
- Page 25, Section 4, line 30: Change “is in the order of 1 magnitude” to “is an order of magnitude” Changed accordingly.
- Page 26, Section 4, line 3: Change to “breaking” Changed accordingly.
- Page 26, Section 4, line 6: Change to “Arctic” Changed accordingly.
- Page 26, Section 4, line 11: Remove “total” Changed accordingly.
- Page 26, Section 4, line 14: Change to “to changes of the order of” Changed accordingly.

- Page 27: Section 4: Change all references of “arctic” to “Arctic” Changed accordingly.
- Page 27, Section 4, line 3: Change to “affect stratospheric” Changed accordingly.
- Page 27, Section 4, line 7/8: Change to “at higher” Changed accordingly.
- Author contributions: Replace reference to EMEP scheme! Changed accordingly.