Earth Syst. Sci. Data Discuss.,
https://doi.org/10.5194/essd-2020-218-RC3, 2021

Earth System Science Data Discussions

Interactive comment on "A Global Total Column Ozone Climate Data Record" *by* Greg E. Bodeker et al.

Anonymous Referee #3

Received and published: 9 January 2021

This study improved the long-term total column ozone data record by extending the relevant satellite data input and statistical methods, as well as adding the uncertainty level accompany the released datasets. As an important data source for climate change study, the update of long-term ozone distribution would be helpful for the community to investigate ozone-related topics and analyses. The manuscript could be improved by addressing the following issues:

1) I would suggest to mark the added satellite data (Figure 1) in a way to show the difference with previous data records.

2) P6 L9, what's the 'additional basis function' in particular? Is that simply' set to zero prior to 22 June 2003 and to 1 thereafter'?

3) By spanning the temporal coverage of each of those non-TOMS/OMI data sets, would this implementation introduce for data sets not covering the time span shown in Figure3?

4) P8 L17, what's the setting for atmosphere when simulating the uncertainties using Monte Carlo? Personally, I would like to know what to come up a way to evaluate the uncertainty prorogated from the data sources to the analysis.

5) P10, L5, Would it be possible to further increase the resolution of this product, like length of each side per pixel of 1° or even higher?

6) The polar night shown in Figure 4 is shaded with a different color.

7) I noticed that the latest three years 2013-2016 is not covered in the validation (Table 3), whyïij§

8) Figure 7, The uncertainties seems to be largest around latitudes of 60°, please discuss the reason. In diagram of Dec/Jan/Feb, why the lines go beyond -20 around 60-90°ïij§

9) Is that the areas close to polar night regions are expected to have larger uncertainties ïij§

10) When using nearest neighbour interpolation to fill missing values, will you test the area of the gap, it might be misleading for filling large areas of missing values.

11) Filling the gap is essentially useful for applications, will the product indicate the regions that is filled with machine learning, while adding uncertainties for these regions might be challenging.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-218, 2020.