Dear Editor,

Thank you very much for your thorough review and comments. Our response is listed below.

The authors have addressed most of the reviewer comments; however, several minor revisions still need to be addressed before the manuscript is ready for publication, as detailed below.

Please consider changing data set to dataset throughout the manuscript. While both are correct, data set is less commonly used (https://www.merriam-webster.com/dictionary/dataset)

In the revised manuscript, "dataset" or “datasets" are used.

L111: information, but the oceanic regions remained with an apparent void of data. -> information, but the oceanic regions remained devoid of data.

The sentence was revised accordingly.

L112: The polar regions in the northern and southern hemispheres …. This phrasing is redundant, just say, “The polar regions are other …”

The sentence was revised accordingly.

L113: During the previous International Polar Year … I think it may be better to simply say, During the International Polar Year …

This part was revised accordingly.

L119: WG has not been defined, and is not in the acronym list.

WG is included in the list.

L121: Please be consistent through-out the manuscript, use O3 or ozone, preferably ozone.

We used ozone throughout the manuscript in the revised manuscript.

L126: The phrase “The resulting two data sets containing …” is confusing because in reality the authors are producing five datasets. A sentence such as “The resulting five datasets include observations from ships/buoys, aircraft, ozonesondes, ground-based coastal/island sites, and polar stations.” And then proceed with the explanation.

The suggestions were included:
L126 of the track-changes version:
The resulting five datasets include observations from ships/buoys, aircraft, ozonesondes, ground-based coastal/island sites, and polar stations. This data paper primarily describes two of these datasets, which consist of 77 ship- or buoy-based observations and 48 aircraft observations over the global oceans and polar regions covering a period between 1977 and 2022.

Figure 1: This figure still needs some tweaks. Bigger symbols on top panel, and consider using the same latitudes as in the text i.e., 90S, 60S, 20S, 0, 20N, 60N, 90N. if you are using python, at least consider using something like plt.legend(markerscale=2) to increase the size of the marker in the legend.

We revised the Figure accordingly.

L152: I found this notation confusing, since to me south pole is latitudes smaller than 60S (because in number notation 60S is -60) but I understand where the authors are coming from. I think to be safe the authors could simply say, 90S-60S and 60N-90N. For the tropics, please say 20S-20N, etc. If the authors agree with this suggestion, please change the rest of the manuscript accordingly.

In the revised manuscript, we used ranges (from south to north).

L169: "The ship's exhaust plume could affect the observations …" Is this only for the DWD-MPI data or for all ship data, please clarify

The ship's exhaust affects not only the DWD-MPI but also all other cruises. This is clarified in L171:
The ship's exhaust plume could affect all of the cruise observations, ...

L175: This phrase is confusing: "First, minute data below (hourly mean) - (1 σ) were removed and then hourly averages were recalculated. The hourly data with minute data where the 1 σ variability is >10% of the hourly mean are then removed." Please rephrase.

The sentence was rephrased for clarification:
L177:
First, minute data below (hourly mean) - (1 σ) were removed and then hourly averages were recalculated. The hourly data were removed if the variability of the valid minute data was greater than 10% of the hourly mean.

L179 – 185: This can be a table in the SI. or excluded ,just say, the data was averaged from the original temporal resolution (1min or 30min) to 1h.

All of these acronyms need to be defined, and citations need to be added for each.

We considered the point. Having a new column in Table 1 will make it even busier. The cruises handled with our procedure to remove ship exhaust plume based on 1 min data are better listed here. Therefore we keep this information in the text but made it as concise as possible.
L186:
The original data from MAGE92, RITS93, RITS94, ACE1, AEROSOLS99-INDOEX, ACE-Asia were on a 30-min basis, and were averaged to hourly. The original hourly data from Malaspina, SAGA3, DWD-MPI, YES-AQ, and MOSAiC were used as they were provided.
The Appendix table included all of the acronyms for the campaign names. The campaign names were not spelled out in the main text because the acronyms serve the purpose of identification. Please note that some of them are just nicknames and are not acronyms.

Please add some discussions about reviewer 2 comment number 6, 8, 9 and 10. Note that the ozonsonde 200m downsampling, was also question by reviewer 1. Make sure to address/mention this in the manuscript.

Regarding the effect of the "land" boundary altitude of 2500m (point 6), we stated in L206 that exceptions may include lifted plumes, such as those from biomass burning. The 2500-m threshold is tentative in an attempt to yield a criterion that is meaningful for the entire globe. It may be revisited after detailed analysis in the assessment.
In response to the point 8, we added a sentence "This was partly affected by the assumed top altitude boundary of "land" at 2500 m." in L251.
In response to the point 9, we added a sentence "Their inclusion could be a future task." (L258)
IN response to the point 10, we added a sentence "The (1/e) ozone sensor response time (~30 s) gives the ozonesonde a vertical resolution of about 150 m for a typical balloon ascent rate (van Malderen et al., 2025)." (L261)

L203: What is the temporal resolution of these meteorological fields.
In L209, we clarified that they are 6 hourly.

L204: Is there an impact due to this change in resolution, please elaborate.
In L210, we stated that Harris et al. (2005) studied the uncertainty of the trajectories using NCEP/NCAR reanalysis. A thorough analysis of the impact due to the change in resolution is a future study.

L237: The data came -> the data originated
Corrected.

L241: Did the authors really launched trajectories for every 10s data point? Is that even useful, what is the

temporal resolution of the meterological fields or was there some temporal averaging?
Yes, we ran the trajectories every 10 s in such cases for aircraft data. It is a straightforward approach though not necessarily meaningful.

L260: … to save the computational cost -> .. to save computational cost.
Corrected.
L276: What is the meaning of obvious zero? How do you define it.
We rephrased: Obviously, the incorrect data (i.e., zero or negative values) have been removed, (L285)

L280: With the exception of Trinidad Head, which can be filtered using local wind direction data (see Table S3), all sites are considered to be primarily influenced by air masses from relatively clean regions.
We simplified this part and mentioned Trinidad Head only:
L289: Data from Trinidad Head can be screened using the local wind direction information (as shown in Table S3)

L305: please rephrase the last 2 sentence, both regions are exceptions to ozone increasing with height. Pehaps something like: The general tendency is that ozone mixing ratios increase with height, except in R7 (Northern Atlantic), where the minimum median values occur in the 700–950 m layer, and in R8 (Tropical Atlantic), where ozone mixing ratios remain nearly constant from 1950 to 5000 m.
We included text as suggested from L315.

L311: Table S6 perhaps will be better as a figure.
We considered the possibility but decided to keep the table, as the range of the values are wide and the variability is difficult to show in a figure.

L320 please define O-Buoy and MOSAiC and add citations.
We added them in the list. Their reference is in Table 1.

L321. The average diurnal profiles were calculated as follows: local time was derived for each data point by adjusting UTC time based on longitude, and then …
Corrected.

L325 The average of the 24-hour medians showed variability across regions -> The average of the hourly medians showed …
Corrected.

Note that Figure 6 is discussed after Figure 7 so I suggest swapping their order.
We checked and found that Figure 6 is discussed earlier than Figure 7. L330 vs. L345.

L353: Ny Alesund -> Ny-Ålesund. (The A needs to be an A-ring letter)
Corrected. Also in the supplementary figure.

Table 1 is really hard to read; it needs to use a horizontal layout instead of a vertical layout. It probably also needs to be broken into two tables to accommodate all the columns in a manner that is readable.
When words are broken due to the column length, please break the words by syllables, to avoid breaking elsewhere, for example, Ancillar-y should be Ancilla-ry, Instrume-nt should be instru-ment, etc.
Long comments can be added as notes at the end of the table,
Corrected. This is to be ensured during the typeset.

In table 1 in the column PI/Data Manager/ WG member worked on the data, what is the meaning of / or // in some rows, please delete the slashes as it is not clear.
We changed the notation. Now the Data manager is shown in round parenthesis, and the WG member worked on the data are shown in square parenthesis.

Table 2 will also benefit from a horizontal layout.
Corrected.

All acronyms on these tables need to be defined in the appendix (second column).
We included many other acronyms for campaigns in the appendix table.

Table 3 why are different times for the maximum/minimum for some regions?
A sentence was added explaining that the different timings must be affected by dynamics and chemistry (L354).

Figure 2: The lat lon labels are too small, as well as the colorbar font.
Only one colorbar is needed
The font sizes of the lat lon labels and colorbar were increased. One colorbar was deleted.

In Figure 1 you used O3 ppb for the label instead of [ozone] (ppb) please be consistent through all figures, I suggest Ozone (ppb) or O3 (ppb). Obviously using a subscript for the “3”.
We used Ozone (ppb) throughout the manuscript.

Figure 3 Last Contact with Land -> Last Contact with Land (LCL)
Corrected.

Supporting information comments:

Please make sure that the acronyms list include the Table S1, S2, etc acronyms.
The acronym table in the main text included those in the Supplement. Also, another acronym table was included at the end of Supplement.

Table S1, S62 row NA -> N/A
Corrected.

Table S3: modify the column length or break the words “regions” and “literature” by syllables.
The table was modified accordingly.

Table S4 may be better using an horizontal layout, pay attention to the word breaks.
The table was modified accordingly.

Figure S2 panel f NyAlesund -> Ny Alesund using A-ring if possible. Remember to unify the x/y labels to O3 or Ozone instead of [O3]
Corrected.

We would like to thank the Editor again for the helpful comments to improve the manuscript.