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# ***Interactive comment on “Extended and refined multi sensor reanalysis of total ozone for the period 1970–2012” by R. J. van der A et al.***

**Anonymous Referee #1**

Received and published: 21 April 2015

## GENERAL COMMENTS

This is an essential paper that describes an important total column ozone database. Personally, I would have thought that this paper would be more suitable for the Earth System Science Data (ESSD) journal but if the editor is comfortable with the paper being published in AMT then I would certainly have no objection. The paper will be suitable for publication in AMT once the concerns detailed below have been dealt with.

## SPECIFIC COMMENTS

Page 1, line 11: For people who are not experts in the field I think that it would be better to say 'surface observations of the ozone column from Brewer and Dobson spectrophotometers'.

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Page 2, line 4: I don't know what the 'it' refers to in this sentence. Is it that the Dobson spectrophotometer network became part of GAW?

Page 2, line 15: 2003-2010 is not a 10 year period.

Page 2, line 17: It is not clear to me what is meant by 'Long consistent'. Perhaps words like 'Multi-decadal structurally homogeneous' better capture what you have in mind?

Page 2, line 17: Rather than the vague term 'ozone protocol' why not specifically refer to the Montreal Protocol?

Page 2, line 21: How does the 'for quantifying ozone depletion' here differ from the 'trend analysis' 3 lines earlier? Aren't these simply stating the same thing?

Page 2, lines 30-31: Can you please be a bit more specific here about what you mean by 'closure of the ozone hole'. Do you mean the seasonal dissipation of the ozone hole that occurs every year or do you mean the long-term recovery of the ozone layer over Antarctica from the effects of ozone depleting substances?

Page 2, line 33: Are you being consistent in your use of the terms 'analysis' and 're-analysis'. Here you refer to the data set as a 'reanalysis' but just two lines earlier at the start of the sentence you refer to this as an 'analysis'.

Page 3, line 5: You should state what the end year was for version 1 of the database.

Page 3, line 19: I am not sure that many readers of your paper will understand what you mean by 'the effective temperature of the total ozone'. I think that you need to explain this in more detail.

Page 3, line 27: This section heading is very obscure. Don't you simply mean 'Satellite-based total ozone measurements'?

Page 4, line 7: You will need to define the 'UV-VIS' acronym here.

Page 5, line 9: Is there a specific reason why the total column ozone measurements

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from the filter instruments were not used?

Page 6, line 27: Is the 'parameterization for the chemical modelling' referred to here the same as that described in van der A et al. (2010)?

Page 7, line 13: You haven't said anything about any differences between version 2.1 and version 2.9 of the Cariolle scheme.

Page 7, line 15: Isn't this repeating information that came on the previous page i.e. page 6, line 31?:

Page 7, line 20: Could, or should, the rejected observations feed back to suggest additions to your 'blacklist'?

Figure 3: I could not see in the figure caption what the grey shaded region refers to.

Page 7, line 30: CFCs entered the stratosphere long before the 1980s. Just have a look at a plot of EESC before 1980.

Page 7, line 31: The Montreal Protocol was endorsed in 1987, long before the plateau in ozone levels.

Page 9, line 14: Do you mean 'restrained' or 'constrained' by the observations?

#### GRAMMAR AND TYPOGRAPHICAL ERRORS

Significant editing will be required to correct the many grammatical errors in the paper. Some (but far from all) are indicated below. Some of the suggested corrections below reflect my own writing style and can be accepted or rejected by the authors as they choose.

Page 1, line 18: I would suggest replacing 'the debiased satellite' with 'the bias-corrected satellite'. And elsewhere in the paper I would suggest replacing 'debiased' with 'bias-corrected'.

Page 1, line 24: Replace 'extended with 13 years' with 'extended by 13 years'.

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Page 1, line 19-20: I think that the whole phrase 'driven by meteorological analyses of the European Centre for Medium-Range Weather Forecasts (ECMWF)' can be deleted since this is stated later in the abstract.

Page 2, line 3: Replace 'the fifties' with 'the 1950s'.

Page 2, line 3: Replace 'are observed' with 'have been observed'.

Page 2, line 3: Replace 'Dobson instruments' with 'Dobson spectrophotometers'.

Page 2, line 5: Replace 'early eighties' with 'early 1980s'.

Page 2, line 8: Replace 'the Nimbus-7' with 'Nimbus-7'.

Page 2, lines 13-14: Replace 'data assimilation' with 'assimilation'.

Page 2, line 23: Replace 'its amendments' with 'its amendments and adjustments'.

Page 2, line 26: Replace 'applications for' with 'applications of'.

Page 2, line 24: Replace 'latest WMO scientific assessment' with 'latest WMO/UNEP scientific assessment'.

Page 2, line 29: Replace 'latest assessment' with 'latest WMO/UNEP scientific assessment'.

Page 3, line 1: Replace 'event splitting up the South Pole vortex' with 'event that split the Antarctic vortex into two sub-vortices'.

Page 3, line 6: Replace 'Since the MSR1 five' with 'Since the MSR1, five'.

Page 3, line 6: Replace 'data has' with 'data have'.

Page 3, line 7: Delete 'Multi Sensor Reanalysis'. You have already defined the acronym and are using it right here and so you don't need to define it again.

Page 3, lines 10-11: 'Total ozone satellite retrieval datasets' is quite a mouthful. Why not just say 'Total ozone measurements'.

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Page 3, line 17: Replace 'data is' with 'data are'.

Page 3, line 18: Replace 'ground observations of ozone' with 'ground-based observations of ozone' since these are not observations of ozone at the ground. Similar changes need to be made elsewhere in the manuscript.

Page 3, line 20: Replace 'into an global' with 'into a global'.

Page 3, line 22: Replace 'chapters' with 'sections'.

Page 3, line 29: Replace 'the seventies' with 'the 1970s' and similarly elsewhere.

Page 4, lines 2-3: Replace 'until the year 2003' with 'until 2003'.

Page 4, lines 8-9: Replace 'was measuring till 2011' with 'measured until 2011'.

Page 4, line 16: Replace 'Level 2 data is' with 'Level 2 data are'.

Page 4, line 21: Replace 'are yet too' with 'are currently too'.

Page 4, line 22: Replace this sentence with 'The annual total number of satellite observations, shown in Figure 2, is seen to grow by several....'.

Page 4, line 23: Replace 'the seventies' with 'the 1970s'.

Page 4, line 24: Replace 'till' with 'until' and likewise elsewhere throughout the manuscript.

Page 5, line 3: I think that it would be clearer if instead of 'made at surface sites' you wrote 'made at ground stations'.

Page 5, line 17: Replace 'of the ground data has' with 'of the ground-based observations have'.

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Interactive comment on *Atmos. Meas. Tech. Discuss.*, 8, 3283, 2015.

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