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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Trends and drivers of ozone human health and vegetation impact metrics from UK EMEP supersite measurements (1990–2013)" *by* C. S. Malley et al.

Anonymous Referee #2

Received and published: 17 February 2015

General comments

The authors have submitted an interesting manuscript focusing on trends and drivers of ozone concentrations and associated potential impacts on human health (SOMO35 and SOMO10) and vegetation (PODY and AOT40). The study is based on ozone measurements from two UK EMEP supersites, applying as chemical climatology framework. The results indicate that over the period 1990-2013 the relative importance of regional photochemical ozone production have decreased while the importance of hemispheric background concentrations have increased. However, the change in health and vegetation impact metrics differ depending on which metric and threshold is chosen.

Ozone is a key air pollutant and it is important to understand how much, and to which direction driving forces will affect ground-level ozone concentrations and their impacts on human health and vegetation. Thus the topic of this manuscript is highly relevant from a scientific and policy-related point of view. The study is comprehensive, well thought through and the manuscript is well written. I therefore suggest publication after minor revisions.

Specific comments

In the introduction and methodology section it is strongly emphasized that the study is based on a chemical climatology approach. When I read the manuscript I feel that this approach is somewhat lost in the result and discussion sections. To be consistent I suggest linking also the second part of the manuscript to the different steps deriving the chemical climate in a more clear way e.g. by more clearly describing different temporal and spatial phases in the chemical climate.

The manuscript is long and especially the amount of text in the result section is heavy for many readers. Numbers that can be found in figures, previous sections or in the supplementary material is unnecessary to repeat and I suggest reducing e.g. the sections about the spatial differences between the two supersites (section 3.1.2 and 3.2.2). Also I think the manuscript could be improved by integrating results and discussion more.

Methods: A map with the two supersites would be appreciated. The ones in the supplementary material are very small. How come meteorology is not measures at the two supersites? Are the meteorological stations representative for the air quality supersites? Is soil moisture also measured? P. 1876, line 23: How can PODY decrease for potato after interpolation of missing data?

Results and discussion: I find the comparison between different impact metrics very interesting and highly relevant in a policy context. The comparison between the vegetation impact metrics PODY and AOT40 is discussed in an own section (3.2.3) but for human health metrics the comparison with the WHO air quality guideline (50 ppb) and

EU target value (60 ppb) is not as easy to find. Much information is there but spread out in different section. The manuscript would benefit if this information is assembled into one paragraph.

P. 1879, line13-14: Why are these specific time periods chosen? Section 3.2.1: Has the timing and length of the growth period changed during the 24-year period? Please discuss if/how that could have influenced your results.

Technical corrections:

P. 1871, line 19: write out the REVIHAAP acronym first time mentioned.

P. 1873, line16: space between NOx and

P. 1877, line 19-21: difficult sentence, please rephrase. Can the paragraph about the trajectories be written more clearly?

P. 1878, line 24: . . .ADs and NADs for SOMO10/35 and PODY?

P. 1884, line 11: . . .representative of much of the rural west and north of the UK. . .

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 1869, 2015.