We would like to thank Reviewer #1 for his/her comments and have responded to each specific point raised below. The original review text is in italics.

Note that since the original submission, one additional modeling group (CICERO) has provided the necessary fields to be part of this analysis. We are therefore including them in the revised paper (with no significant changes to the multi-model mean fields). In addition, we have included additional co-authors in relation to the ice-core data we are using in this analysis.

The paper is generally descriptive and that in itself is extremely helpful to the community. What would also be helpful would be the addition of a section on 1) how models should be modified to make them more accurate, and 2) how measurement strategies should be changed to make them more useful to both the atmospheric modeling and the ecological communities.

These are two interesting points that we will expand upon in the discussion section. We will however focus on aspects relevant to the atmospheric modeling communities since this is where our expertise lies.

Page 6250, lines 16-17: "NOy and NHx are collectively identified as reactive Nitrogen (Nr)".

The common definition of reactive N is 'all species other than N2' since 'reactive' includes N species that are biologically, chemically or radiatively active. Given this, it would be best not to use Nr to define NOy and NHx.

Thank you for this clarification. We will not make use of Nr.

Pages 6254-5, Section 3: What about data from marine regions such as Bermuda or data from other remote or semi-remote locations?

Our approach has been to focus on the WMO dataset because of its high-degree of coverage. Furthermore, the analysis is used as a way to use the present analysis to compare with previously published analysis and studies. Therefore, we have focused our analysis on Europe, North America and Asia. However, the key novel aspect of the present paper resides in its use of observed long-term changes in deposition to test models.

Page 6255, line 6: "....qualified as 'good'." How is 'good' defined?

This text has been revised to more explicitly describe the process. Note also, that the paper (Vet et al.) is now submitted (Atmospheric Environment) and contains the full description of the analysis.

Page 6262, line 26:

*The equation 2*SOx+NOy-NHx is correct if you are talking about atmospheric*

acidification. It is not correct if you are talking about potential ecosystem acidification because NHx has the potential to be nitrified to NO3 in the form of nitric acid. Thus the deposition of NHx to soils is actually an acidifying process.

We will correct the characterization of the acidification. Thank you for this clarification.

Page 6267, lines 16-19: For the Fowler et al. reference, the date needs to be changed to '2013' and the spelling of 'Leech' needs to be changed to 'Leach'.

We will correct the typo and update the reference.