We would like to thank Reviewer #3 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.

What I've been missing is a discussion of how to improve the situation by a) suggesting types and regions for measurements which are currently under sampled and potentially also uncertain given the larger model spread identified e.g. in Figure S6, as well as b) a discussion as to why the models differ, and which parts of them need to be improved.

These are two interesting points that we will expand upon in the discussion section. In the trend analysis over the North America and Europe, there is an attempt at using the precipitation fields to differentiate the role of physical processes and emissions in driving the spread in deposition. We will expand on that discussion in the final section of the paper.

Minor comments

Introduction. Since the title mentions N and S, I would have expected a little introduction early on as to why S deposition is important similar to the first paragraph on N deposition. There is a sentence in page 6251, line 13ff, which seems too late.

This is a very good suggestion and we will 1) expand the S discussion somewhat and 2) position it right after the N discussion.

page 6251, line 22: "rather representative". Are they representative or not, and if not, in which aspect?

We are using climate simulations (hence not observed meteorology) and so they are only similar in a climate sense. We will clarify this aspect of our study.

page 6254, line 3ff: It would be very helpful here to have a table, which model provided which output - otherwise this section is too vague to really follow.

We will add such table in the supplement.

page 6255 line 2: please provide a reference or something comparable for the wet deposition data set used.

There is now a Vet et al., paper submitted to Atmospheric Environment.

page 6255 line 6: please specify the criteria of what is "good".

We will discuss some of the methodologies used. Note that this is part of the Vet et al paper and so we'll only include the main points.

Section 5: I would propose to split this into two subsection, one focussing on the recent past (1980-2000) and one on the change from the "pre-industrial state". (1850-2000).

This is a very good suggestion and we will modify the text accordingly.

page 6259, line 3: It's not immediately clear what "This" refers to, please clarify.

We will rewrite the sentence ("this" refers to the fact that the NH_3 emissions are almost identical in 1980 and 2000).

Section 6: It would make sense to mention the time-scale in the heading, as has been done for Section 5.

Agreed, will add.

Page 6262 line 5. It would be good if the authors could add a little discussion of the reasons for the larger model spread in Central Asia and South America - if possible

That is indeed an interesting point. We will perform some additional analysis to see if we can identify the cause for such a spread.