

Interactive comment on “Reconstruction of spatially detailed global map of NH_4^+ and NO_3^- application in synthetic nitrogen fertilizer” by Kazuya Nishina et al.

Anonymous Referee #1

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This manuscript provides a good dataset for nitrogen biogeochemistry study. It made a great effort to impute missing data, and it provides $\text{NH}_4/\text{NO}_3^-$ ratio, which is unique. I have the following suggestions for the author to revise. 1. The authors used a crop calendar map for the seasonal distribution of fertilizer in a grid, which is good. However, even within a grid, the calendar of the major crop may vary and the fertilizer input vary accordingly. Therefore I suggest author allow crop calendar to vary, for example, a period of 10-15 days. This can be done with a normal distribution, not in a uniform distribution. 2. In the results section, there needs some description on the seasonality of fertilizer input, say, give results of some sample regions. Otherwise it does not match the methodology section. 3. For the second dose of fertilizer, it was not consistent in

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the text. Somewhere says 45 days after the first, somewhere says 30 days after the first. 4. Section 3.4 seems not meaningful and thus not necessary. 5. For large countries like US, China and India, fertilizer rate for the same crop may have large regional difference. If possible, for these three large and major nitrogen consumption countries, it is better to obtain N consumption data at subnational level.

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