

## ***Interactive comment on “Historical Nitrogen Fertilizer Use in Agricultural Ecosystem of the Continental United States during 1850–2015: Application rate, Timing, and Fertilizer Types” by Peiyu Cao et al.***

**Anonymous Referee #2**

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I appreciate that the editor has offered this albeit late opportunity to comment. The dataset of historical nitrogen fertilizer use in agricultural ecosystem across the Continental United States itself is already quite important, not to mention its importance to assess the key biogeochemical processes and water quality. I do understand that there is no perfect way to generate such dataset. So I think this dataset and paper is worth to publish in this journal. But there are some information needs to be clarified before its acceptance and publication.

Line 87-90. For different datasets at national level, is there any gap among those

C1

datasets or do they have smooth connection among different datasets. For Mehring et al., 1957, do they provide annual data for each year?

For the crop pasture N consumption, did the author assume the N were evenly distributed? In addition, I was a little suspicious about using the ratio for the year 1964 to cover entire period during 1945-2015. At least, the authors should discuss the related uncertainties raised.

Regarding the temporal change of nitrogen fertilizer consumption, what is the reason for the peak and big drop during 1980s and near 2010?

There are many approximations required to produce the nitrogen fertilizer maps, and then to allocate the Nfer to different crops at different time period. The authors may need to discuss these in greater detail than you do in the “uncertainties” section.

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