

Interactive comment on “Global nitrogen and phosphorus fertilizer use for agriculture production in the past half century: Shifted hot spots and nutrient imbalance” by Chaoqun Lu and Hanqin Tian

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Notes on ESSD 2016-24 and ESSD-2016-35.

Both products achieve the same global resolution (0.5 x 0.5 degrees over global land areas) for approximately similar time periods (1961 to 2010 in one case, 1961 to 2013 in the other case). Both report total synthetic N applied as chemical fertiliser. One elaborates NO₃ and NH₄ components of the total N, the other adds total P. One starts from country self-reported fertiliser use statistics (from FAO) while the other starts from industry reported fertiliser consumption records (IFA). Both use identical third party crop

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area data (e.g. Monfreda) but different historical land use data. Both adopt the year 2000 for intercomparison and validation purposes. Both report very similar increases in total global use of N fertilisers over the time period but they differ slightly in their discussion of geographic and country-specific use patterns over time.

If, as I suspect, both data sets achieve positive reviews, e.g. seem likely to prove useful to readers and subsequent users, and presuming that from the separate review processes ESSD would not designate one or the other data set as preferred, then subsequent users will necessarily need to make a choice between somewhat similar data sets. In that case it seems fair and useful, and a proper use of the open discussion process, to pose a short series of questions to both sets of authors, and to expect that the separate responses should provide a guide to unique aspects and strengths of each data set.

How does the choice of different starting sources, FAOSTAT vs IFA, influence the subsequent processing and overall quality of the derived product?

Does the difference in tactics adopted to deal with variable completeness of country data (imputation to fill gaps in one case and focus on primarily the largest fertiliser users in the other case) induce a substantial or insubstantial difference in the outcomes of the two data production efforts.

Both sets of authors compare their products to Potter et al. 2010 and specifically for the year 2000. If each set of authors now includes the other data set in that comparison, do their overall conclusions change?

What specific information about time histories or geographic patterns of fertiliser use do readers and users gain from the inclusion of NH₄ and NO₃ data in the one case and from the inclusion of P data in the other case?

Finally, how does each set of authors see their efforts and products as complimentary to the other effort?

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