

Interactive comment on “Nitrogen storage and variability in paddy soils of China” by J. S. Lin et al.

Anonymous Referee #2

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This paper clearly gave the N storage in paddy soils of China and furthermore correlated to physical factors. Author used much more data and exact digital map to estimate N storage and N density. I think that results are believable and interested in wide readers. It is considered to be published. However, I have some comments and suggestions.

1. Authors concluded that this research used more soil profiles, and higher resolution soil map than previous research. Therefore the reliability of N storage provided by this research is unprecedented for soils in China. For supporting this conclusion, it is suggested that authors may compare the N storage estimated under less soil profiles like 525 used by Tian et al. (2006) with present results using same digital map and look if there is difference between them. Through adding soil profiles, authors would

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be able to find profile number with N storage estimation with stable uncertainty. I think that this is very important, because it can be told that least soil profiles are needed for N storage estimation when national soil N survey.

2. The data that authors used are from 1980s. Actually, a lot of new data on paddy soil N have been published since 1980. Authors would have a discussion on soil N changes in past almost 30 years.

Some details: 1. P. 856, L 23: Please specify the biogeochemical cycling is C or N. 2. P. 857, L 16: What are village soil and sediment? Please give definition. 3. P. 857, L 18: Don't understand what the NOMINAL means. 4. P. 857, L 28: The expression is not exact. Tian et al. (2006) had conducted nationwide estimates of paddy soil N storage as mentioned above. 5. P. 859, L 24-26: How to determine the depth of paddy soils? This expression seems not to be closely related to the paper's theme. 6. P. 860, L 10: The distribution area of soil profile j would be presented distribution area of soil profile j. 7. P. 861, L 3: Please specify what differences. What method was used to calculate the significance of difference? 8. P. 861, L 10: Please specify the distribution pattern in profile or region? 9. P. 861, L 11: Layer might be depth? 10. P. 861, L 21: Please give the reference on the national mean of N density. 11. P. 864, L 6-9: I don't think that this explanation is correct. The C.V. of SOC in different paddy soil profiles was 74.6% and 100.8% (Table 2). However, the SOC still has closely relation to total N content. 12. P. 864, L 12: "In profile layer". Which layer? 13. P. 864, L 17-18: Don't understand the expression. 14. P. 864, L 22-23: "The temperature can explain no more than 51.5% variation of total N in surface layer." What's evidence? From Table 4, R2 of N density vs T is just 0.025 $[(-0.159)^2 = 2.53\%]$ or 0.018 $[(-0.134)^2 = 1.80\%]$. Please check it. 15. Authors would add the area of South China Sea Islands in Fig. 1 and 2.

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