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

**J. S. Lin et al.**

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Anonymous Referee #2 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.

Question 1:

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

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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 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.

Answer:

This is a good suggestion. We have compared the results with different profiles numbers, and prepare in another paper (Under review). Through adding soil profiles, we found out profile number over 1300 will stable uncertainty within 95%. However, the purpose of this paper was to discuss the N storage and variability in paddy soils, so we do not add this part of research in this paper.

Question 2:

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.

Answer:

Yes, you are right. There are some new data have published since 1980, but only few parts of county have such data. In addition, no new national data (such as second National Soil Survey data) had been available in China right now. Therefore, we think second National Soil Survey database is the optimal choice when doing a research of paddy soil's N storage in the whole country.

Question 3:

1. P. 856, L 23: Please specify the biogeochemical cycling is C or N.

Answer:

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Agree. We specify the biogeochemical is C cycling.

Question 4:

2. P. 857, L 16: What are village soil and sediment? Please give definition.

Answer:

We have revised “village soil and sediment” into “soil and sediment around the village”

Question 5:

3. P. 857, L 18: Don't understand what the NOMINAL means.

Answer:

We have changed “Nominal” into “few”.

Question 6:

4. P. 857, L 28: The expression is not exact. Tian et al. (2006) had conducted nation-wide estimates of paddy soil N storage as mentioned above.

Answer:

Agree. We have revised it.

Question 7:

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.

Answer:

Because calculate total N storage of paddy soils need the depth of soil. The depth of paddy soils recorded in each profiles data that available in the database of second national soil survey of China (National Soil Survey Office, 1993a, 1994a, 1994b, 1995a, 1995b, 1996).

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Question 8:

6. P. 860, L 10: The distribution area of soil profile j would be presented distribution area of soil profile j.

Answer:

Agree. We have revised it.

Question 9:

7. P. 861, L 3: Please specify what differences. What method was used to calculate the significance of difference?

Answer:

We have revised the difference into correlation.

Question 10:

8. P. 861, L 10: Please specify the distribution pattern in profile or region?

Answer:

Agree. We have revised it.

Question 11:

9. P. 861, L 11: Layer might be depth?

Answer:

Agree. Revised.

Question 12:

10. P. 861, L 21: Please give the reference on the national mean of N density.

Answer:

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We added the reference on the national mean of N density.

Question 13:

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.

Answer:

Agree. We deleted the explanation of C.V. is the reason of no correlation between total N and N fertilizer.

Question 14:

12. P. 864, L 12: "In profile layer". Which layer?

Answer:

We revised profile layer into 0-100 cm layer.

Question 15:

13. P. 864, L 17-18: Don't understand the expression.

Answer:

We revised it into "The R2 change values of other pairs of datasets were no more than 0.01."

Question 16:

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.

Answer:

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Yes, you are right. We revised this sentence into “Moreover, the temperature can explain no more than 3 % variation of total N in surface layer.”

Question 17:

15. Authors would add the area of South China Sea Islands in Fig. 1 and 2.

Answer:

Agree. We added the area of South China Sea Island in Fig 1 and 2. (See the attach Figure 1 and Figure 2)

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Interactive comment on Biogeosciences Discuss., 7, 855, 2010.

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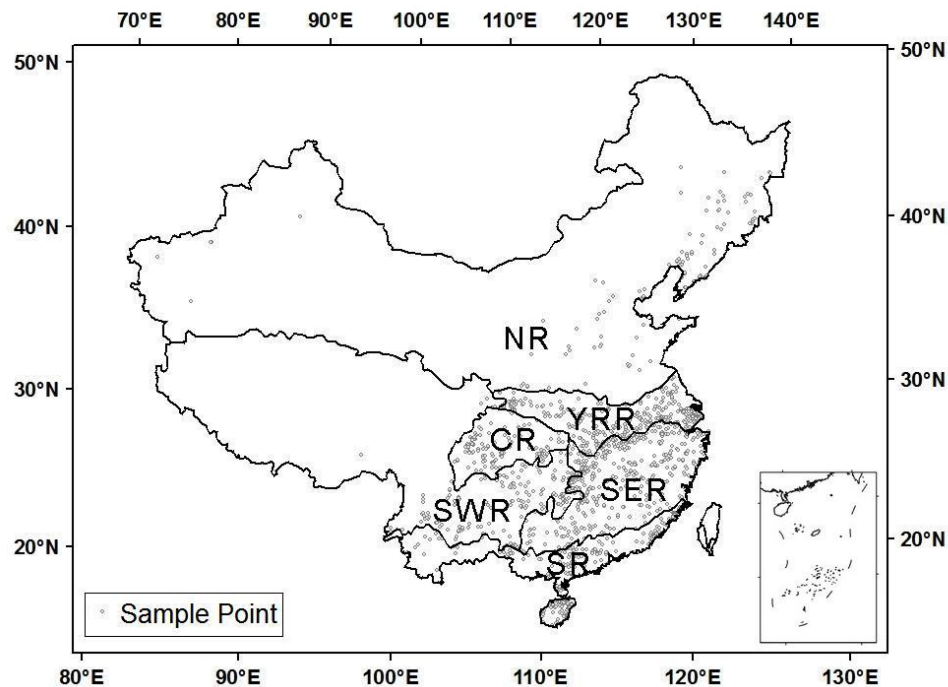


Fig. 1. Fig. 1



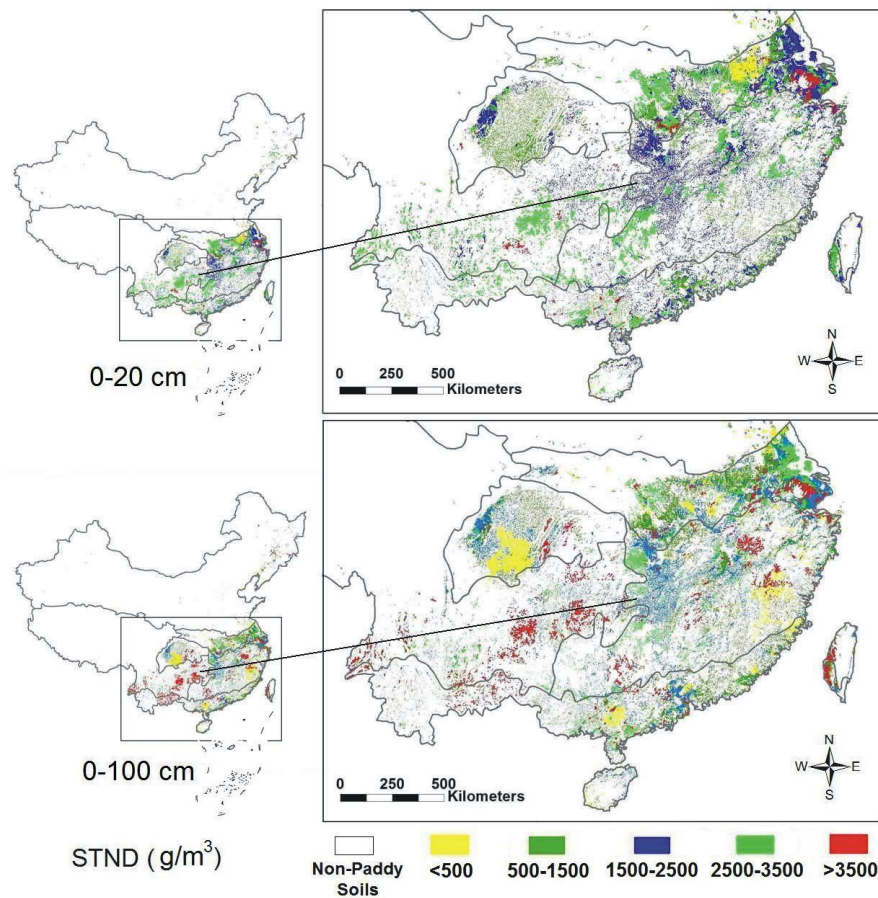


Fig. 2. Fig. 2