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Interactive comment on "Estimating net anthropogenic nitrogen inputs (NANI) in the Lake Dianchi Basin of China" *by* W. Gao et al.

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We would like to thank Anonymous Referee #1 for taking the time to comment on our manuscript and offering many constructive suggestion.

"General comments: This paper focused on the estimation of NANI in Lake Dianchi Basin in China using two different weighting methods such as land area and land uses. The analysis between NANI and riverine N exports provided interesting insights to understand the anthropogenic N behavior in the basin with different land-use and human activities. I found that the overall manuscripts are well described and acceptable as an original article although some minor revisions are needed prior to the final acceptance as listed below. In abstract and conclusion, you mentioned the negative intercept of Fig 5 implying the consequences of massive pollution controls in those watersheds. The

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negative intercept actually suggested the existences of the threshold values of NANI for the watershed N retention around 10,000 kg/km2/y, but I couldn't find any other strong evidences to indicate the role of pollution control on riverine N export in those watersheds. I recommend deleting those discussions on the influence of pollution control. Specific comments - Page 4128 Line 12 "three significant figures" is unclear in this sentence. Reword. – Page 4130 Line 2 Insert "(NNFI)" after the "Net food and feed N import" because you used NNFI in page 4131 line 24. – Page 4131 Line 24 If you indicate watershed 15 here, add 12 as well. The NANI of watershed 12 is comparable those of 15 in Table 2. – Page 4137 Line 10-11 You described that "results of both methods showed strong linear relationship with riverine N export", but the linear relationship using area-weighting was weak relation and insignificant in Fig. 5(a). You cannot conclude that both methods showed the strong linear relationship."

Specific comments and response

(1) "In abstract and conclusion, you mentioned the negative intercept of Fig 5 implying the consequences of massive pollution controls in those watersheds. The negative intercept actually suggested the existences of the threshold values of NANI for the watershed N retention around 10,000 kg/km2/y, but I couldn't find any other strong evidences to indicate the role of pollution control on riverine N export in those watersheds. I recommend deleting those discussions on the influence of pollution control."

Authors' response: We agree that more evidences should be provided to demonstrate the role of pollution control on riverine N export. The influence of pollution control (e.g. sewage treatment plants) on riverine N export in the basin was assessed by comparing the differences in the relationship between NANI (net anthropogenic N inputs) and riverine export by comparing the effect of including and not including the estimated N reduction from sewage treatment plants. A new figure (Fig. 5c) was supplied to show the difference. The result shows that adding the N removed by treatment plants to the riverine N export would significantly improve the relationship, i.e. that the effect of the N removal is to weaken the linear relationship between NANI and riverine N fluxes.

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Therefore, we believe pollution control is an important factor in analyzing riverine N export, particularly in small, populous watersheds. In Page 4136, we added a new graph "To assess the effect of the N removal on riverine N export, N removed by the six sewage treatment plants (Fig. 7) was added to the riverine N export in the affected watersheds. According to the drainage area of each sewage treatment plant, N removed by sewage treatment plants 1, 4, and 5 was added to riverine N export in watershed 12 while riverine N export in watershed 4, 5, 14 was revised by N removed by sewage treatment plants 2, 6, and 3 respectively. A new relationship between NANI and revised riverine export is developed (Fig. 5c). Compared with conventional method (Fig. 5b), a higher R2 was found in the adjusted function ($p<0.0001$). Furthermore, the statistical significance of intercept is better ($p<0.005$). It is clear that the effect of the N removal is to weaken the linear relationship between NANI and riverine N fluxes. Therefore, we believe pollution control is an important factor in analyzing riverine N export, particularly in small, populous watersheds.

(2) "Page 4128 Line 12 "three significant figures" is unclear in this sentence."

Authors' response: Thank you for your question. We have changed the sentence as follows: ". . ., we generally present NANI and its components to the nearest 100 kg-N km-2 yr-1".

(3) "Reword. – Page 4130 Line 2 Insert "(NNFI)" after the "Net food and feed N import" because you used NNFI in page 4131 line 24."

Authors' response: Thank you for your correction. We have inserted "(NFFI)" after the "Net food and feed N import" in page 4131 line 24.

(4) "Page 4131 Line 24 If you indicate watershed 15 here, add 12 as well. The NANI of watershed 12 is comparable those of 15 in Table 2. "

Authors' response: We agree that watershed 12 should be added there too. A correction has been made according to the referee's suggestion.

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(5) Page 4137 Line 10-11 You described that “results of both methods showed strong linear relationship with riverine N export”, but the linear relationship using area-weighting was weak relation and insignificant in Fig. 5(a). You cannot conclude that both methods showed the strong linear relationship.

Authors’ response: We agree that this sentence should be corrected. The sentence “results of both methods showed strong linear relationship with riverine N export” is deleted and revised as “NANI results based on the land use-weighting method were found to be more reliable (better R2, better significance level, better consistency with past research) than results from the area-weighting method.” in the conclusions.

Interactive comment on Biogeosciences Discuss., 11, 4123, 2014.

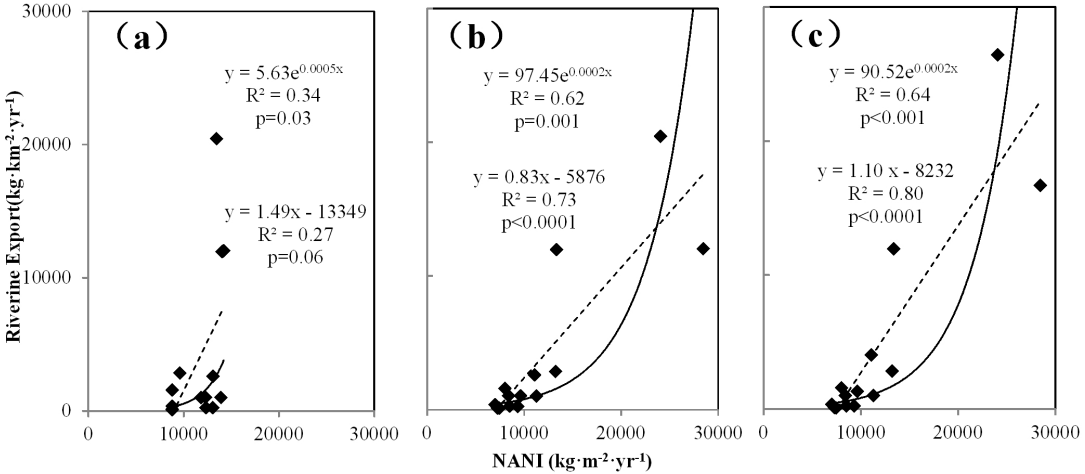

Fig. 1.

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