

Interactive comment on “Dissolved inorganic nitrogen in a tropical estuary at Malaysia: transport and transformation” by Shan Jiang et al.

Anonymous Referee #1

Received and published: 24 March 2019

Currently, the research documents for nitrogen circling in tropical estuaries are relatively limited, especially in South-eastern Asia. In the manuscript, the authors established a solid database, including dissolved nitrogen concentrations, particle nitrogen concentrations, and stable isotope fractions for nitrate and particle nitrogen, from three surveys in a tropical river, i.e. Rajang, in Sarawak state, Borneo. The authors described the source of dissolved inorganic nitrogen in the river water and likely reactions in the estuary. The seasonal variations and linkage between climate events and reactions were also included in the manuscript. This work adds valuable knowledge for us to understand the nitrogen turnover in the tropical zone. In addition, this manuscript provides useful information for nitrogen budget estimation on a global scale. The suggestions for the improvement of this manuscript are as follows. It would be glad to see

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the revised version based on my feedback. Major comments: 1. In the introduction part, the authors introduced well about the other nitrogen research and the purpose in this paper. However, the meaning of this study was not quite clear. Maybe, for instance, 'the rapid industrialization of tropical countries had increased the N input from river which potentially increased the marine N load. This budget should be reevaluated precisely.' Please state the importance of this research and perhaps use some numbers to make the significance more attractive. 2. In the discussion part 2, authors indicated 'The overlying water seeped into the sediment along the conduits created by crabs and worms'. This process would probably modify the isotopic compositions of nitrate according to some research, which might affect the isotope analysis of nitrogen transformation. Is this phenomenon can be discovered in this study?

Minor comments: 1. Page 1, line 29, change 'Gruber and Galloway 2008' to 'Gruber and Galloway, 2008) 2. Page 2, line 12, change 'isotope ratios' into 'isotope fractions' because δ indicates the fraction. 3. Page 2, line 15, 'Yan et al. 2007' should be '2017' 4. Page 2, line 26, it is better to be 'response ... to ...', not 'response ... on ...' 5. Page 2, line 32, it should be 'typically tropical' 6. In the MM section, authors described the figure as 'Fig. 1 B', while it was changed to 'Fig. 7A' in the Discussion, please keep one style. 7. Page 3, line 7, add space in 'Fig.1' 8. Page 3, line 15, please change to 'Rajang is the largest river' 9. Page 3, line 20, change 'accumulation for 6000 years' to '6000-year accumulation' 10. Page 3, line 25, change 'tributaries' to 'tributary' 11. Page 3, line 26, change 'meter' to 'meters' or 'm' 12. Page 4, line 4, authors used U.S. here and used 'USA' in the following, please change to 'USA' 13. Page 4, line 7, I believe authors did not collect pore water before Sep 2017, so remove 'Additional' in this sentence 14. Page 4, line 10, change 'HDPE' to 'High Density Polyethylene (HDPE)' 15. Page 4, line 12, please define 'DO' here 16. Page 4, line 13, perhaps it is better with 'at low tide' 17. Page 6, line 8, it is better to offer the number of figure in SM. You can add '(Fig. S1 to Fig. S10)' at the end of the sentence. 18. Page 5, line 10, the definition of DON has been mentioned on page 2, you can use DON directly 19. Page 8, line 4, maybe it is better to use 'Rajang river water' compared to 'fresh river water'

20. Page 8, line 7, authors used U.S.A. here, please be unified. In addition, add 'the' in front of 'Pearl River', the same for the remaining rivers in the sentence. 21. Page 9, line 7, change to 'This concentration increase generally results from. . .'. 22. Page 9, line 8, add 'the' before 'Rajang Delta'. 23. Page 9, line 9, the streams also can be found from Fig. 1. Maybe it is better to add Fig. 1 as a reference as well. 24. Page 9, line 13, it is better to be 'large contact areas'. 25. Page 9, line 14, maybe wave actions and density difference also enhance the pore water exchange. Authors can add these effects or add 'mainly' in the sentence. 26. Page 9, line 30, it is better to be '15N-NO3-enriched water, i.e. . . , into Rajang.'. 27. Page 9, line 31, 'reduction in DON', did you mean 'compared to the conservative mixing'? Please clarify. 28. Page 10, line 27, it is better to be 'significant level' than 'identifiable level'. 29. Page 10, line 28, passive voice is necessary. 'The influence. . . may be enhanced.'. 30. Page 11, line 31, it is better to be 'along several streams'. 31. Page 12, line 6, authors used italic f here, please change the characters in other sections at Discussion. 32. Page 12, line 27, authors used 'receive more attention' several times, maybe change to 'be noticed'. 33. Page 13, line 1, I think it not proper to say the linkage between climate and N circling, please use climate events instead. 34. Page 13, line 3, please change to 'on particle surfaces'. 35. Page 13, line 9, I believe it should be passive voice, please change to 'can be treated as a. . .'. 36. Page 13, line 13, it should be 'for the second and third cruise'. 37. Page 13, line 13 and 14, please set 'in-situ' in italics. 38. Page 15, line 17, please remove 'Suimon Mizu Shigen Gakkaishi' from the reference, I think it is an error from authors' software. 39. Page 17, line 7, it looks like the authors missed an author (B. D. Eyre) for the reference 'The driving forces of porewater and groundwater flow in permeable coastal sediments: A review'. 40. Figure 1, the word in Fig. 1C is a bit blur. In addition, the authors did not clarify the meaning for the yellow color in Fig. 1B (I guess it is deforestation) in the legend. Please add this information. 41. Figure 7, the reference style should be changed in the legend. 42. Figure 8, please separate A and B a bit, it is easy to misunderstand 'atmosphere'.

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