

Interactive comment on “Behaviour of Dissolved Phosphorus with the associated nutrients in relation to phytoplankton biomass of the Rajang River-South China Sea continuum” by Edwin Sien Aun Sia et al.

Anonymous Referee #1

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General comments

The manuscript describes the results of water quality sampling procedures for the Rajang River -South China Sea continuum. The manuscript represents a contribution to scientific progress, presenting new spatially and seasonally varied data for the area of interest. The scientific methods and assumptions are clearly outlined, the estimation of DIP export to the sea is useful for understanding the system behavior. However, the major comments are related to a better definition of goals of the study, data visualization and interpretation of the results. In my opinion, the data collected and analyzed,

especially nutrient concentrations could be represented better, so that another type of comparison could be applied focusing more on measurements (e.g. faceted boxplots). For example, it is hard to identify the type of the sediment or the time of the sampling in Figures 2-4 and relate them to Table 1. In addition, I would focus more of the actual measurements, rather than ratios, or report both (Table 1, Figures 2-4). I would be more careful with statements about phytoplankton preferences of DIP and DOP based on correlations of these variables, in addition to low nutrient ratios leading to lower phytoplankton biomass. Furthermore, I think that conclusion about a particular nutrient limitation based on the ratios might be misleading, unless there are clear indications of low nutrient concentrations. The ratio can be high, however the concentrations of bioavailable nutrients could be also high, thus none of the nutrients might be limiting phytoplankton growth.

Specific comments

1. 19-21 Rework the sentence “..for example, despite...”
2. 25 “distribution fate?”
3. 25-27 Place abbreviations of water quality samples in parenthesis
4. 30-32 It is hard to understand what is “removal” means. Did DIP decreased by 57.78%?
5. 32-33 Suggest rephrase, not clear: The bulk = major fraction of?
6. 33-35 Which preference is it?
7. 36-38 Back to general comments: what if the increased NO₃:DIP ratio in wet season was due to higher discharge and consequently loading of NO₃? How can ratios lead to anything?
8. 65-67 Rephrase the sentence
9. 76-79 Too convoluted sentence, suggest divide into 2
10. 81-83 Too convoluted, suggest divide into 2
11. 85-87 Rephrase, too wordy
12. 93-112 Talking about Carbon here, but that is not the focus of this study. Basically there is a need in a smoother transition between the gaps in knowledge and the goals of the study
13. 118-120 Should go to figure caption. And similar paragraphs just occupy space
14. 136-137 Change to “which can be thicker than 1 m”
15. 155-160 All these categories and classifications should be visualized on a study map (Fig. 1)
16. 164-165 So in Methods it is stated that there were 2 surveys, while in Abstract 3 sampling campaigns (Line 23) are mentioned. How many were

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there? 17. 194-201 Looks more like discussion 18. 227 Change to “obtained from” 19. 248-254 Very confusing way of writing the equation. Why not state the equation, number it and explain the conversions, variables and units in the text? 20. 260-262, 273-274 Again, should be in a figure caption, or removed. It is a strange way to start a paragraph/section 21. 291 Starts with the same information as in 285. This should be cleaned 22. 316-317 DIN:DIP would be definitely correlated with DIP, because there is DIP on both sides 23. 320-321 Change or remove this sentence 24. 322-327 Which parameters are discussed? Was there any parameterization? 25. 350-351 DIP increases towards the sea while 358-359 says that there is a removal of DIP towards the coast. I am confused 26. 374 Use “is” instead of “are” 27. 378-385 It is hard to understand the connection between the citation and the idea. I see that Funukawa et al 1996 stated that N and P are fairly high in soil solution, but how from this sentence 383-383 can be concluded? 28. 394-395 Instead of “addition” it is better to use “increase” 29. 411-412 How can DOP and DOC be compared? 30. 416-420 Back to general comments: the ratio can be high but the concentrations also can be high 31. 443-444 Chl a can be uncorrelated with DIP, but how is this reflected by NO₃:DIP ratios? 32. 447 Change “mass transport of biomass” 33. 473 Why use “Thus”? It is not clearly following from the previous sentence 34. 473-477 Is it really evident? I agree that DOP can be possibly utilized by phytoplankton, but the increase of DOP concentration does not indicate a preference switch. It is actually supported by discussion at 469-470 that DIP is easier to consume. 35. 491-493 Still did not understand why the estimated figures are useful 36. 495-498 Too convoluted 37. 498-499 It is unclear what exactly Seitzinger et al 2005 justifies 38. 505-508 Too convoluted, suggest split into at least 2 sentences 39. 532-555 Needs additional work as Conclusion is largely based on the points mentioned above

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