Biogeosciences

Discussions

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comment

Interactive comment on "Rain-fed streams dilute inorganic nutrients but subsidise organic matter-associated nutrients in coastal waters of the northeast Pacific Ocean" *by* Kyra A. St. Pierre et al.

Anonymous Referee #1

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General comments

This paper presents valuable and unique riverine nutrient dataset with surprisingly low macronutrient concentrations. In general, we consider that riverine nutrient loadings fertilize coastal primary production and then ecosystems. However, the present study demonstrates a quite different picture. This paper contains useful data for both freshwater and marine researchers and can connect the separated research fields so far. The following points should be improved before this paper being considered for publishing in Biogeosciences.

Major comments

1. A link between Introduction-results-discussion-conclusion is not established well. In particular, the key issues described in Discussion section are not appropriately raised in Introduction section. Some improvements for this can lead the reader smoothly from Introduction to Conclusion.

2. Very low inorganic macronutrient concentrations in the present freshwater systems is unique and interesting. I would like to confirm whether freshwater nutrient concentrations in these watersheds have not been reported in past studies. If this is the first report, that should state clearly. If some previous studies exist, the authors should describe whether the present results are consistent with previous results. Another important message of this study may be the importance of measurements of organic nutrients such as DON and DOP in addition to inorganic macronutrients, because organic nutrients are less frequently analyzed for river waters.

Specific comments

3. L37. Silicon is usually treated as a macronutrient as shown by the authors for C:N:Si:P:Fe stoichiometory in the next paragraph.

4. L75. Readers need to know why this system should be targeted, but we cannnot find any explanations in Introduction section.

5. L215. Please show a reason for using the "Half".

6. L261. Fig. 2a –> 2b

7. L264. Highest temperatures are found in July from the X-axis label.

8. L269. From Fig.3a, highest Chl-a may be found in May 2015 for me.

9. L270. Detailed explanations are required how the authors determine the peaks of primary production.

10. L271. What is the advantage to show mean nutrient concentrations in marine waters regardless of such large seasonal variations?

11. L319. PN –> particulate N (PN = TN − TDN)

12. L387. St. Pierre and Oliver et al. –> St. Pierre et al.?

13. L390. The "assuming no loss" for dFe is generally not acceptable as shown in Fig. 6.

14. L413. So, what are these related to the Kwakshua Channel system?

15. L477. As well as heavily human-impacted watersheds, not impacted watersheds also probably have been studied. Such data can be picked up here and discussed with the present results.

16. L498. The terrestrial DON flux may elevate the contribution of riverine N on marine primary production of this system, but that is probably still quantitatively a small portion to support primary production.

17. L502. Kortzinger et al. 2001?

18. L508. The author should examine relative abundance of Si and N in subsurface waters, which is the primary source of nutrients for the Channel system surface waters. Si will be enriched than N in such source waters.

19. L631. Whether N input as DON have a significant impact on the spring bloom should be examined quantitatively with some assumptions. Lack of marine DON data may be an issue for this consideration.

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