Biogeosciences

Discussions

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Interactive comment on "Importance of within-lake processes in affecting the dynamics of dissolved organic carbon and dissolved organic and inorganic nitrogen in an Adirondack forested lake/watershed" by P.-G. Kang et al.

Anonymous Referee #1

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General comments This paper describes long-term data series of dissolved organic carbon (DOC, years 1984-2009) and dissolved organic and inorganic nitrogen (DON and DIN, years 1994-2009) concentrations, and comparison of calculated mass balances (2000-2009) of these species between in- and outlets of a lake belonging to the Adirondack Long-term Monitoring Program. Data seems to be of high quality, rather frequent, and continuous. Input-output comparison based on concentrations measured on weekly basis. Authors found that the lake is sink of DOC and DIN (retention), but varying between a small sink or source of DON. No long-term trends were found in

concentrations or input or output fluxes.

The data may be valuable to document even though no long-term changes in flux patterns were seen. However, the within-lake processes determining the output to input ratio were only discussed on literature basis. I let the editors decide whether the Biogeosciences could be the forum for this paper. The manuscript would benefit from a revision. Inorganic carbon was not included nor much discussed in this study, opposite to inorganic nitrogen. However it could have significant role when pondering the meaning of lake as a DOC sink. Many lakes are known to emit substantial amounts of carbon as CO_2 to the atmosphere. I am also concerned how relevant some of the statistical testing was, particularly if not testing a hypothesis. Therefore hypothesis formulation and modification of the text (introduction, discussion) accordingly could improve the readability and make the text more interesting. I feel that the paper is lengthy relative to its content, but cannot give exact advice how to organize it. Some detailed comments below.

Abstract l. 5. in aquatic systems? Abstract l. 7. be more specific. P. 17291, l. 24. Delete palustrine, could you give dominant vegetation also for the peatland. P. 17292, chapters 2.2, 2.3. 2.4 could be combined. ALTM in the heading is not very informative. p. 17293, l. 12. How many inlets there are in total or do you mean here some other water and matter input routes? Unclear. p. 17294. l. 22. Why the monthly discharge-weighted concentrations were tested? See my general comments. p. 17297, l. 5-10, move to the discussion P. 173021, l. 10-15. Discuss what is the fate of decomposition end products and how much actually is retained in the lake?

Tables and figures. Quite many tables, Table 1. "with r value 0.5 or greater"? Table 4. You may consider leaving the I-O column away, because you also give the retention%. Figure 2. Show discharge data also as a scatter plot. Figure 6. …and share of the annual flux (%). Modify the y-axis title (%) Figure 7. ..significant difference from the zero? Figure 8. Part of the DIC is likely released from the system to the atmosphere. Shall you include that direction too.

Potentially useful reference Sarkkola, S., Nieminen, M., Koivusalo, H., Laurén, A., Kortelainen, P., Mattsson, T., Palviainen, M., Piirainen, S., Starr, M. & Finér, L. 2012: Trends in concentrations and export of nitrogen in boreal forest streams. Boreal Env. Res. 17: 85–101.

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