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Biogeosciences Discussions

Interactive comment on "Linkage between the temporal and spatial variability of dissolved organic matter and whole stream metabolism" *by* S. Halbedel et al.

Anonymous Referee #1

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In its present form the manuscript does hardly fulfill the standards of BGD. It is not concise, includes a lot of speculations, and the language (English) seems not adequate for an international audience (but English is not my first language!). However, the authors collected data (particularly on DOM) that may deserve publication after the ms has been rewritten or resubmitted. The editor should be aware, that my main expertise is on stream (ecosystem) metabolism and to a lesser extent on organic matter dynamics in aquatic ecosystems.

GENERAL COMMENT

The objectives of this investigation were to detect a) linkages between DOC com-

position and stream metabolism, b) the seasonality in DOC composition and stream metabolism, and c) the influence of land use on DOC and stream metabolism. The study design included seasonal assessments of DOC composition (spring, summer, autumn, winter) and stream metabolism (4 days in a row in sp, su, aut) in 2 forest streams and 2 non-forest streams. The 2 non-forest streams were remarkably different, and thus, cannot be considered as replicates. Fluorescence spectroscopy was used to characterize DOC, oxygen time series were used to calculate stream metabolism.

Changes in DOC composition with season and land use are an interesting aspect as well as the link between stream metabolism and DOC composition. However, the conclusions about the relationship between metabolism parameters and DOC composition is based on mere correlations. The strong statement on page 18276 [3]We showed that this mechanism is driven by the allochthonous and autochthonous biological activity as well as by the linkage between the stream water and the allochthonous environment[2] is rather based on speculations than hard data. Seasonal variation in stream metabolism as well as the influence of land use on stream metabolism has already been addressed in quite a few studies. In this respect, this investigation does not provide new insights, particularly in face of relatively few measurements during one annual cycle. Moreover, stream metabolism was not measured during winter and frequent spates during summer apparently affected metabolism rates.

The manuscript can be shortened, particularly introduction (too much details and citations) and discussion. The manuscript would gain substantially if the main focus were mainly on DOM. The authors should try to state a hypothesis or two, restrict their efforts to test it, and not get lost in unnecessary speculations/digressions. The metabolism data may be used to characterize the study system but not to demonstrate the influence of season and land use on GPP and CR. Metabolism equations: where is the re-aeration term? All DOM parameters such as C1, C2 and the respective ratios should be introduced in Methods and not in Results. Why not use C1, C2, and C3 (these seem to be straightforward parameters at least according to table 2) instead

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of the not very intuitive ratios C1:C2 etc? Is it possible to allocate total DOM in the different components?

Interactive comment on Biogeosciences Discuss., 9, 18253, 2012.