

Interactive comment on “Landscape scale patterns in the character of natural organic matter in a Swedish boreal stream network” by J. Temnerud et al.

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Overall Assessment

This is an original and important paper which I believe should be published. The scientific significance and the quality of the science and presentation are all excellent. A discussion of the landscape-scale patterns of dissolved organic matter (DOM) quality is well within the scope of HESS. The novelty of the paper lies in the wide range of techniques used to characterise organic matter quality and the presentation of the results using multivariate statistics. Characterising organic matter quality at low as opposed to high flows also adds to the novelty of this work. I believe the conclusions are ap-

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appropriate for the results the authors present. The methods are very clearly described and are both valid and appropriate. The results are sufficient to support the interpretations and conclusions. I believe the results are traceable and proper credit is given to related work. The strength and originality of their contribution is abundantly clear for reasons I mention in subsequent paragraphs. The title clearly reflects the contents of the paper and the abstract provides a complete and concise summary. The overall presentation is well structured and clear; the language is fluent and precise and the necessary symbols are used in an appropriate manner. I have some minor concerns about clarification which are described in subsequent paragraphs. There is no need to reduce, combine or eliminate any parts of this work. The number and quality of references are appropriate. The authors did not provide any supplementary material and I do not believe any is necessary.

To my knowledge, there is nothing else in the literature which covers such a wide range of sites and uses as broad a suite of methods for analysing DOM quality. I am looking forward to the publication of this paper. I believe it will be well-cited as it fills an important gap in the literature.

It is becoming increasingly clear that changes in DOM quality, and not just quantity have important environmental implications. The authors are to be commended for the wide range of techniques they used to analyse quality in their data set. Using a wide range of techniques to analyse organic matter quality leads to greater insights than could be obtained from single techniques in isolation.

I am very pleased to see the authors' use of multivariate statistics in summarizing their data set. Graphs like Figure 2 are a very powerful way of summarizing a large amount of information. This type of analysis should be published as I believe it provides a useful way forwards for understanding complex data sets.

If I have one criticism, it is that the authors do not provide enough justification for conducting the sampling during periods of low summer flow. I am convinced that sampling

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during summer periods of low flow is important for the reasons the authors state on p. 3264 lines 1-7. Can the insights the authors gained from sampling at low flows be compared or contrasted with what Buffam et al. (2008) found from high-flow sampling? The authors do make a brief reference to different amounts of variability between high and low-flow conditions (i.e. p. 3279 line 21 – p. 3280 line 9), but it would be nice to see this expanded. Would the authors agree that the differences between spring and summer sampling are purely hydrological or are other factors also operating in the catchment?

Minor comments

When multiple references are given to support a statement, the authors should adopt a consistent format for listing them. (i.e. p. 3263 lines 13-14 are alphabetical, p. 3263 lines 11-12 are alphabetical by year and p.3263 lines 8-9 do not appear to be sorted)

Some works are cited but not included in the reference list: p. 3266, line 10: Ivarsson 2000 and p. 3279, line 18: Petersson 2002

There is a formatting problem in the references: p. 3290, line 15 should not be indented.

Had the authors considered presenting the data in Figures 2 and 3 with log(Catchment Size) on the horizontal axis? I don't know if it would change any of the interpretations but would make it easier to see what is going on with the smaller catchments.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3261, 2009.

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