

Interactive comment on “New molecular evidence for surface and sub-surface soil erosion controls on the composition of stream DOM during storm events” by Marie Denis et al.

Anonymous Referee #2

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Dear,

I have finished my review of the manuscript “New molecular evidence for surface and subsurface soil erosion controls on the composition of stream DOM during storm events”, submitted to Biogeosciences by Marie Denis and co-authors.

I find that the paper is written in a clear way, the authors have targeted three clear research questions using an appropriately chosen dataset and methodology. The line of thought is clear. The method of analysis chosen (thermally assisted hydrolysis and methylation) is appropriate to target the variety of compounds that allow to characterize DOM in soils and headwater. In my opinion simulating the in-stream process does not

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add much to the manuscript.

Minor comments:

P2 L 19. Give some references for these mixing analysis and isotopic studies.

P4 L 8. Could the authors comment on the possible effect on the soil/water equilibrium and the associated liberated DOC that is caused by deploying a zero-tension lysometer?

P4 L 15. Why was the soil only sampled in the riparian transect? Is there no difference expected with the slope soils in molecular composition?

P5 L23-25. This sentence does not really belong in the methods section.

P5 L31. This should be Jeanneau et al. (2014). “Jeanneau, L., Jaffrezic, A., Pierson-Wickmann, A.-C., Gruau, G., Lambert, T., and Petitjean, P.: Constraints on the Sources and Production Mechanisms of Dissolved Organic Matter in Soils from Molecular Biomarkers, Vadose Zone J., 13, 2014”

P5 L29. The method used here is developed for soils (Jeanneau et al., 2014). How are you taking phytoplankton fatty acids into account? These are generally polyunsaturated long-chain compounds, did you find any of these? Would it be beneficial to use ratios between specific biomarkers for plants, bacteria, possibly fungi and phytoplankton biomass?

P6 L20. I’m surprised that it is possible to use the values on the PC axes to calculate the relative contribution of the sources. Could you provide a reference that supports this approach?

P6 L20. Why are the axes called F1 and F2 instead of PC1 and PC2 (principal component). That would make the figures more intuitive to read as well.

P6 L24. The coordinates ‘were’.

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P8 L10. How do you determine that an event is significantly different based on a PCA? Did you use a statistical test? How much of the variance is explained by the first two principal components? This determines how well the ordination space reflects the complete variance between the compounds, and how reliable a statement such as 'significantly different' is.

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