

Interactive comment on “From soil water to surface water – how the riparian zone controls the transport of major and trace elements from a boreal forest to a stream” by Fredrik Lidman et al.

Anonymous Referee #3

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This is an interesting and generally well-written paper presenting the effects of the riparian zone on the transport of elements – in fact how organic matter is affecting the dynamic of different elements. This paper also documents the great value of long-term monitoring data from catchments having a well-thought sampling design. I particularly like the figures illustrating the effect of the riparian zone. However, before the manuscript might be published in Biogeosciences, it needs some revision (moderate), particularly a shortening of the whole manuscript. There are some repetitions which can easily be removed. I did not count how often the authors mentioned that higher concentrations of most of the elements occurred in the riparian zone. It is a pity that the pH as a very crucial parameter was not measured. I would like to see a short

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explanation about the potential estimation error of the pH on the results and I would not use the pH for further statistical analysis as the PCA. Furthermore, I would shorten the description of the results regarding pH values (keep the limitations in mind). I do not agree with the approach to estimate biological uptake. The authors just collected some leaves and measured concentrations of some elements in these leaves. This is not uptake – just a concentration. Please consider that in your manuscript and add a short description about the meaning of these element concentrations. The whole section related to biological uptake can be largely shortened. In section 3.6 you are referring to a change from relatively dry organic-poor mineral soils to wetter organic soils. Do you have any quantitative information about this gradient, i.e. contents and / or stocks of soil organic carbon?

Some minor comments: There is no “organic content” (e.g. page 3, line 27). Please be more specific (e.g. content of organic carbon). Please explain acronyms (e.g. TOC: page 3, line 5; REEs: page 5, line 18). Figure 2: I would indicate the thickness of the organic soil horizons in the upper panel.

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