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Hydrology and Earth System Sciences Discussions

Interactive comment on "Landscape elements and river chemistry as affected by river regulation – a 3-D perspective" *by* E. Smedberg et al.

E. Smedberg et al.

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As a response to the comments by Referee #2 we have made the following changes to the paper:

Comment: "The analysis is interesting, however none additional information is furnished about the effect of the coarse-graining elimination of numerous streams and maybe a part of land covers with dimension less of 250 m. This aspect is very important because can affect the precision of the "hot-spot" of the river loading of dissolved constituents. This point needs to be clarified"

Response: We have added the following paragraph to the paper:

Scale and resolution. When using spatially distributed data, scale, classification and

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generalization always is an issue, especially affecting features and areas with an extent smaller than the used resolution. In this study, landscape features such as small mires, bogs and tributaries may have been overlooked due to their relative small size. However, our resolution covers all first order streams (Strahler, 1957) that were defined by CCM2 using a 100m DEM (Vogt et al., 2007). The effect of eliminating small landscape elements such as mosaic occurrences of, for example, bare rock or mires in a deciduous forest would be that the entire area would be classified as deciduous forest only as the dominating landscape form. Therefore the specific role of mosaic river elements for river loading can not be addressed in this study. However, a fine resolution is more critical when focusing on detailed processes such as connectivity between land and stream in riparian zones where small tributaries will be lost in coarse resolution maps and also, the amount of near-stream area as a fraction of watershed area will increase (Baker, 2006). In this study, we looked at large scale differences in vegetation cover and types and their proximity to the main river channels that has been drained. Undoubtedly, land cover data with a finer resolution would have located greater amounts of small patches of vegetation types. With the used scale on the DEM and the land cover classification, the boundaries of the vital vegetation types will, admittedly, be fuzzier than with a finer scale that would produce more focused "hot-spot" areas. However, these pin pointed areas would still, most likely, be located within the areas located using the coarser scale. Finally, the used information on river chemistry was only provided on an even coarser scale. The smallest scale of available river chemistry data is the junction of first and second order streams defined by the CCM2 and, thus, disregards the contribution of individual landscape patches.

Ref:

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Vogt, J. V., Soille, P., de Jager, A., Rimaviciute, E., Mehl, W., Haastrup, P., Paracchini, M. L., Dusart, J., Bódis, K., Foisneau, S., and Bamps, C.: Developing a pan-European Data Base of Drainage Networks and Catchment Boundaries from a 100 Metre DEM, Proceedings AGILE International Conference, May 2007.

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