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Biogeosciences Discussions



# *Interactive comment on* "Increasing iron concentrations in surface waters – a factor behind brownification?" *by* E. S. Kritzberg and S. M. Ekström

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Dear Professor Lundin, Thank you for making us aware of this study. We have now taken part of it and found several aspects that we find interesting in relation to our study, i.e.: 1) DOC and Fe are both higher in waters in managed (clear-felled and drained) basins than in virgin forested basins, and in addition Fe:DOC ratios are higher in managed basins than in virgin forested and virgin partly wetland basins. 2) While DOC in the profile of a till soil is gradually decreasing with depth, Fe has a maximum in the illuvial horizon (at about 0.5 meters) that is accompanied by a pronounced maximum in water color. 3) Fe and DOC in streamwater from a forested and moist basin



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is at a minimum during peak flow in May and increasing to reach maximum concentrations in the warmer months of July, August and September. The increase in Fe is larger than that of DOC (3.2-fold and 2.6-fold respectively). The fact that Fe is increasing more than DOC during this period may be due to high groundwater levels and warm temperatures that produce anoxic conditions and the release of ferrous iron.

In all, this suggests that silviculture, and especially clear-felling, may result in increased water color from both Fe and DOC due to changes in the groundwater level. We will incorporate the potential role of silviculture in the discussion of our study. Moreover, in future studies addressing the role of Fe to brownification, we will focus on a few catchments with known land-use to see how Fe varies as a function of groundwater levels with potential connection to both silviculture and changes in climate.

With your knowledge of the development of silviculture in Sweden during the last decades, do you believe it can be a substantial contributor to the observed trends of water color, Fe and DOC?

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Interactive comment on Biogeosciences Discuss., 8, 12285, 2011.