



***Interactive comment on* “Technical Note: Linking soil – and stream-water chemistry based on a riparian flow-concentration integration model” by J. Seibert et al.**

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Received and published: 1 October 2009

This paper will be of interest to an international audience, especially those with a specific interest in riparian zone hydrology and biogeochemistry. It does, however, need some editing before it is ready for publication. There are also some issues to address, including the provision of a more complete set of references relating to the use of rating curves. There are several big assumptions that need more support via relevant references and argument.

Detailed comments:

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5604/2 metres (not meters) - there are other instances later too.

5604/4 "vertical distribution of lateral water flow" is not very clear. 5604,12 profiles,

5604/14 variations in stream water chemistry

5604/24 What are "chemostats"? this needs explaining and suitable references providing, if possible.

5605/13 Not sure that "matter" is quite the right word.

5605/20 where understanding of the RZ is needed to explain ...

5605/20 this whole paragraph is not very fluent and needs to be better expressed.

5605/28 It is a "conceptual" model, surely? "Perceptual" means something quite different.

5606/20 are, of course,

5606/21 Rather,

5607/20 50 measurements is a rather small number from which to establish a rating curve. Often, people use several hundred samples. The authors should comment on this.

5608/2 If the soils are dominated by organic material at the surface, we need to know how the peat affects the hydrology. What is its hydraulic conductivity? Is the model of reducing K with depth compromised by this peat layer? (cf Figure 2). Is the peat the most permeable soil layer?

5608/6 organic-rich

5609/5 "based on observed variations in flow" - I would like to see some evidence given my earlier comment.

5609/21 thus,

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5610/11 "extensive evidence of saturated hydraulic conductivity increasing upwards in the soil profile" A wider group of references could be cited here, including non-Scandinavian locations. Kirkby (1978) would be a good place to start as there was quite a lot of thought given to this by people like Weyman, Whipkey and Kirkby himself in the 1970s.

5610/14 "As long as there is no bypass flow" - quite a big assumption!

5610/19 This is another big assumption! Some references would help, and some acknowledgement that this does not necessarily occur (e.g. Pilgrim, Huff and Steele, 1979).

5611/4 Below,

5612/7 sometimes this is referred to ...

5612/8 There is a lack of reference to early literature on the use of rating curves. i think particularly of Walling and Webb's extensive work, and Rob Ferguson's important paper (WRR 1986) on the dangers of using rating curves to calculate loads. This all needs including. The two references given seem a bit arbitrary and suggest the extensive literature on rating curves has not been investigated. The same point arises at 5616/26.

5612/10 Here,

5612/17 could, of course,

5613/4 Here,

5613/6 Is "motivated" quite the right word?

5614/20 profiles,

5614/27 constituents,

5615/21 there might indeed be other explanations and this seems to need a little more

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discussion. It is always potentially dangerous to infer slope response from observations in-stream.

5617/5 This seems to confirm how ...

5617/11 "that the not the riparian zone not always resets" - rephrase!

5617/14 "we assume" another big assumption. Some mention of the problems of a lumped model might be included since clearly the influence of the RZ must vary spatially.

5617/25 With regard

5617/27 RIM,

5618/16 temperature-dependent

5618/17 included in the model

5619/1 explain MeHg

5619/6 "this useful approach as the RIM model" - rephrase

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 5603, 2009.

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