

Dear Dr. Lupon

Thank you for uploading the revised manuscript. You have properly addressed the points and questions that have been raised.

There are just a few things that need clarification before I can accept the paper for publication:

- L. 34: The word *stems* might be more appropriate than *derives*.
- L. 38: Insert *concentrations* or *levels* after inorganic N.
- L. 41 – 43: I still cannot see why a higher water table should increase the residence time. The average residence time is given by the ratio between water-filled volume in the flow domain and the flux. Generally the hydraulic gradients towards a stream increase with increasing water table causing higher flux rates. Hence, from a hydraulic point of view I disagree with your argument.

However, a higher water table may establish the contact of the groundwater with organic topsoil (as you point out) possibly causing denitrification.

Please clarify.

- Definition and values for basal area. This aspect is still confusing. On the one hand, you use slightly different terms. On L. 96 you mention *total* basal area, on L. 123 you mention *area-specific* BA. Do the two terms mean the same quantity or not?

Furthermore, your explanation on L. 96 – 98 is not clear: As you define BA on L. 96/97 it is a value for a single, individual tree (dimension: an area such as m<sup>2</sup>). How can this value increase 12-fold along the catchment? Or do you refer to area-specific BA as explained on L. 122 – 124 (dimensionless: m<sup>2</sup> m<sup>-2</sup>)? This area-specific BA however, is not given by the equation on L. 96/97 but by

$$BA_{area-spec} = \frac{\pi \times \sum_i r_i^2}{A_{unit}}$$

where *i* represents the index of the individual trees in the unit area *A<sub>unit</sub>*.

Finally, the statement about the 12-fold increase (L. 98) seems to contradict the values you provide in Tab. 1. From your data on mean width of the riparian forest and the tree basal area per unit river length one can calculate the BA per unit riparian area. The resulting numbers are 0.023 and 0.031 for the headwater and the valley reaches, respectively. Hence, the difference seems to be much lower.

You have to clarify these issues.

- L. 102 – 114 (not 115 – 116!): Use the present tense.
- Table 2: Is it correct that for *Q<sub>gw</sub>* there was no seasonal difference? If yes, is this due to the fact that most of values were zero?

In addition, I have two suggestions. Feel free to consider them or leave the manuscript as it is:

- Fig. R1: By including this figure in the SI you would strengthen the evidence provided to the reader that there was little N transformation occurring during sampling (L. 140).

- Fig. R2: Also this figure could be useful is it was included into the SI (L. 114 – 116).

Sincerely

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