

## ***Interactive comment on “Diffuse hydrological mass transport through catchments: scenario analysis of physical and biogeochemical uncertainty effects” by K. Persson et al.***

### **Anonymous Referee #1**

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The paper addresses an oft neglected but important aspect of solute transport from diffuse sources: the role of physical and biogeochemical variability on the resultant solute mass loading. The paper is well written and the conclusions are significant and interesting. I would recommend the paper for publication after the authors address some minor comments: 1. 1st sentence in the abstract: I would delete the words uncertainty and cross-correlation here. It is difficult to understand “uncertainty of what”, “cross correlation between what” at this stage in the manuscript 2. Line 10 in abstract: the sentence is confusing – “. . .substantial risk to underestimate” can be modified to “. . .substantial risk arising from underestimation” 3. Pg 4731, 1st paragraph: is the

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equation for the negative correlation case correct? The equation implies that  $\lambda$  is negative here – I don't think that's what the authors mean 4. An important factor that the authors never mention is that the entire catchment might not be agricultural land, and thus there is spatial variability in the diffuse mass loading in the catchment instead of the uniform loading that the authors have implicitly assumed. Some discussion in the conclusion about the spatial structure of the diffuse mass loading over the catchment, and its role in modifying the solute mass load, might be important

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