

## ***Interactive comment on “Nested-scale discharge and groundwater level monitoring to improve predictions of flow route discharges and nitrate loads” by Y. van der Velde et al.***

### **Anonymous Referee #2**

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The authors describe the application of the Lowland Groundwater Surface Water Interaction (LGSi) model to capture variations in discharge and nitrate loads at nested scales within the 6.5 km<sup>2</sup> Hupsel Brooks Catchment in the Netherlands. The upscaling approach described in this paper, using the groundwater depth distribution (GDD) curve, is novel and of interest. The paper is well written and is technically sound. I would recommend the paper for publication, once the authors address the following concerns: 1. The authors have published quite a few papers using the LGSi model and the nested measurement data at the site. While Velde et al. (2009) [HESS] describes the LGSi model for water, Velde et al. (2010) [WRR] describes nitrate modeling. Both

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these papers use nested data and the measured GDD. The authors need to clarify in the Introduction how the contributions in this paper are different from their already published work. They have made some attempts to do this, but it needs to be clearer and more explicit with specific references to all their published works at this site. 2. The title and the introduction suggested that the manuscript is about prediction of discharge and nitrate loads. However, the authors don't really present a nitrate transport model. They assume nitrate concentrations to be constant in the different flow pathways, and use flow route mixing to predict nitrate concentrations at the outlet. Of the thirteen figures presented in this paper, only figure 13 shows nitrate predictions using this very simplified mixing model. Thus, I would suggest that the authors focus on the prediction of flow route contributions in the model, and remove the nitrate section. 3. I would suggest deletion of Figure 3. The authors present the same information in Figures 8 and 9.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 8427, 2010.

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