

## ***Interactive comment on “Water and nutrient balances in a large tile-drained agricultural catchment: a distributed modeling study” by H. Li et al.***

### **Anonymous Referee #2**

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Major critical points and problems to be solved:

1. There is no overview of other coupled hydrological and biogeochemical process models in the Introduction. It has to be included. 2. The authors do not present results for suspended sediments due to lack of data. Hence, there is no sense to include the description of this module at all. Just a statement that sediments are considered is sufficient. 3. The results for dissolved Phosphorus are rather poor (Fig. 5). There should be an explanation or discussion. 4. Point sources have to be included. Maybe

this would improve the results for DP modeling? 5. N and P dynamics are compared only visually. Please add criteria of fit for concentrations or loads. 6. The calibration and validation periods should be distinguished.

Minor problems: 1. The paper is too long. Description of sediment and nutrient processes parametrization (on seven pages now) should be shortened or presented as a Table. Formulation of objective in the Results section (p. 19, l. 8-11) should be removed. Description of Fig. 8 (p. 22-23) is too long and could be shortened. The summary could be shortened as well, e.g. first couple of sentences (“in this paper we have explored...”) could be excluded. 2. p. 5, l. 1-4: not clearly formulated sentence: was the model extended for this research, or before and now “taken”? 3. Please check terminology use: “sub-region” and “sub-zone” should be consistent in the whole paper. 4. What is the meaning: p.6, l.1: “specified number of REWs”? Specified by whom? How? Based on what? 5. As vegetation zone and unsaturated zone are different zones, it is not clear how the vegetation-related processes (e.g. root zone and root-related water and nutrient uptake) are represented in the model. This should be clarified. 6. Formula (1): please explain how the depth of the saturated layer is calculated; is it a state variable in the model? 7. Fig. 3: please show the modeled part of the catchment. 8. Fig. 5: really data with hourly time step? Or daily? 9. Percent bias is 5%, or 0.05% here (p. 20)? 10. p. 23, l.17: increasing trend or correlation? 11. Fig. 10 could be substituted by a long-term average seasonal dynamics. 12. Description of Fig. 10 (p. 25) includes the listing of components, which is not necessary here and should be excluded.

Recommendation: A MODERATE REVISION

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