

Interactive comment on “Groundwater–surface water relations in regulated lowland catchments; hydrological and hydrochemical effects of a major change in surface water level management” by Joachim Rozemeijer et al.

Anonymous Referee #2

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General comments The manuscript “Groundwater-surface water relations in regulated lowland catchments; hydrological and hydrochemical effects of a major change in surface water level management” aims at assessing flexible water level management schemes in contrast to a fixed water level management. In general the topic is highly interesting but I see some considerable weaknesses in the methodological approach and the amount and quality of available data. The main concern I have is the weak linkage between the monitoring efforts and the balance modelling. It seems that the two year monitoring scheme was not conducted to answer the question of this study

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and hence it was not possible to use the data to clearly distinguish different operating schemes in the study catchments. It looks like that the two year period was too short. This problem is further on also relevant for the balance modelling, because a validation of the models was not carried out. It is not clear how the balance model is supported by the data. Furthermore it is not clear how the simple balance model does account for changes in residence time and the associated changes in matter transformation and fluxes, especially for an invalidated application. Therefore I cannot suggest the manuscript for publication because the given results are not fully supported by data and suggested models. A resubmission seems only be justified if the dataset can be extended and or a more process based model can be applied.

Specific comments Page 1, line 26: the type of model should be specified

Page 2, line 4: flexible water level regime water balance scenarios are unclear, please specify

Page 2, line 6 and also line 11: not clear whether this are measured or modelled results/analysis, please clarify

Page 2, line 15: questionable whether this transfer to the global scale is supported by data, because characteristics of lowland areas are highly variable at the global scale

Page 5, line 6: references are missing on this statement

Page 5: line 16-29: this paragraph should be part of the method section and not of the introduction

Page 5: line 26: it is not clear why first the intense monitoring is mentioned and one sentence later it is stated that this monitoring was not adequate to analyse changing water levels

Page 5: line 28: the objectives of the study are not clearly stated

Page 8: line 3: the monitoring was not carried out to analyse the objective of the study,

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this causes problems with regard to the comparability of the findings of the different polder catchments

Page 9 line 1: what is the frequency of precipitation measurement solute measurements

Page 8: line 6-25: it is unclear where and how many groundwater, discharge and water quality measurement stations have been conducted, at least a summary table should be given

Page 9: line 27: missing surface water quality measurements is critical because it is not clear that soil solute concentrations are similar to surface water. Top soil layer can have very high nutrient concentrations although they are not only subject to transport but also to transformation on the flow path to the surface waters; this is especially true for N and P compounds.

Page 10: it is not clear how the balance model has been validated, no methodological procedures are given in the method section

Page 12, line 19: the results on the water and matter balance model are very brief and not really clear.

I did not review the discussion.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2017-636>, 2018.

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