

Interactive comment on “A daily salt balance model for representing stream salinity generation process following land use change” by M. A. Bari and K. R. J. Smettem

M. A. Bari and K. R. J. Smettem

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Dear Editor,

We would like to thank the referees for open and constructive criticism of our paper. We have responded to it and modified the paper as detailed in response to reviewers' comments.

Authors

Editor Comments: As you can see from the enclosed reviews of the manuscript [A daily salt balance model for representing stream salinity generation process following land use change](#); the referees recommend major revisions. The main critical points brought up by both reviewers are: (i) the title is too general and (ii)

the manuscript is not clearly structured, e.g. model description is mixed with results. Further information on the characteristics study area and the dominating hydrological processes is needed, so that reader can better evaluate the proposed model structure. The authors should explain the underlying water balance model that far that the paper is understandable standing alone. The physical meaning of the parameters C and C_u of the salt balance model should be discussed, especially if the authors propose their model as building block for regional models. Parameter sensitivity and parameter interconnection of the model should be discussed (unfortunately this important issue is presented in a different manuscript). The authors should better work out the innovation and main conclusions from the presented modelling approach.

Please carefully address the reviewers' recommendations within your revised manuscript and prepare a detailed list that explains how you addressed their comments.

Author Response: The structure of the paper has been modified substantially in line with the general comments made by the editor and two reviewers. The title has been modified. The description of the experimental catchments is elaborated (Section 2). The water balance model was described in detail in Section 4. Initial indicative values of two salinity related parameters could be obtained from the salt content of the Dry and Wet Stores and the salinity of the shallow (2-3 m deep) bores. This is elaborated in Section 5; Calibration and data requirements. Once calibrated these two parameter values remained unchanged over time. In the basin-scale operational model where this salt and water balance model was used as a building block; calibrated values of these two parameters remain unchanged across the basin. These two parameters have some physical meaning and represent transport and mixing processes; convection, advection, dispersion, diffusion and dilution. Sensitivity analysis has been undertaken. Please see the response to reviews comments for details.

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