Earth **Surface**
Dynamics
Discussions

Interactive comment on "Modelling of sedimentation processes inside Roseires Reservoir (Sudan)" *by* A. Y. A. Omer et al.

Anonymous Referee #1

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The paper ''Modelling of sedimentation processes inside Roseires Reservoir (Sudan)" deals with sedimentation in a very large reservoir in Sudan. Due to high rates of sedimentation, the reservoir lost one third of its capacity since its origin. In order to find sediment management solutions, the sediment dynamics have to be understood, therefore the authors try to detail the sedimentation pattern in the lake. Due to the large size of the reservoir, environmental conditions and economical issues, the quantity of data and the possibility of performing large field campaigns are limited In order to optimize the coring campaigns, the authors use a numerical morphological model to find the best locations for the cores. The paper is clear, the methods are well described. The paper is well written and organized. The approach chosen by the authors of using a morphological model to optimize a field campaign is orginal. The contrary is more frequent that is to say comparing numerical results with coring to check the numerical

model. The scientific work is limited by the amount of data, but it is thorough. The different steps of the work are well explained. I think the last part of the paper "model verification based on soil stratification data" really needs more details. In particular sampling data could be more discussed: for example is there a trend in the grain size in function of the dam distance? According to the data, are the model parameters well chosen (settling velocity, critical shear stress)? The paper lacks of literature references of similar works in order to show how the method is original and how it could be difficult to understand sediment dynamics in such large reservoir. I have also some specific comments, questions and remarks that could improve the paper: - It is said that dredging is executed every year in front of the power intake, is the dredged sediment grain sizes measured? - In the numerical model, could you explain a little more if consolidation effects are taken into account, if not why? - Could you indicate some details about the calculation: calculation time step, calculation time for the whole simulated period? - It could be very interesting to have some indications on a sensitivity analysis of the model to numerical and physical parameters

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