Earth **Surface**
Dynamics
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Discussions

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

Anonymous Referee #2

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This study reports the use of a morphodynamic model to study sedimentation processes in a reservoir on the Blue Nile in Soudan. It further tries to use the model output to select suitable coring sites and study stratification processes in the reservoir sediments.

Given the quite poor agreement between model predictions and topographic surveys the authors need to be more clear and more precise about the data treatment and model calibration procedures.

They must also take time to discuss these issues in the discussion. Discussing model discrepancies, where and why they arise, would certainly be of interest to readers potentially interested by such approaches.

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Interactive Discussion

Discussion Paper

Following are the main issues the paper has to deal with.

2 reservoir sedimentation from bathymetric data

l13 p156 can you give indications about the filtering and treatment process and the reasons for this ? how where surveys performed and what are the associated uncertainties ?

Table 1 given the way volumes are estimated an assessment of uncertainty is needed.

3 Available hydrodynamic and sediment data

l28 p157 How is the sand proportion estimated ? what is the bed grain size distribution before the dam ?

5.1 model description.

(1) You can not rely on the fact that you use a known code. You must provide in a table, and discuss in the text, the values of parameters used (concernig the 3-D effects you mention) and of closure coefficients for the k-e model. You must also clearly state whether you have explored a range of parameterizations and discuss its outcome. (2) You use a depth averaged version of the hydrodynamic model so you must discuss the interest of coupling it to a 3D sediment conservation equation and how you handle the vertical coordinate ? (3) Where does eq(2) come from ? (4) What are the values of each and every parameter you describe in eqs (2-4) and how where they quantified (this is only partly answered in the calibration sections) ?

5.2 hydrodynamic calibration

You have a bathymetric survey in 2009. The fact that you need to modify it to calibrate the hydrology presents a problem either for the model or the bathymetric data. You should show the calibration result with the measured topography for comparison purposes and discuss this issue in more details.

5.3 morphodynamic calibration

Lines 9-13 ??? Can you explain this procedure ? written this way it looks obscure l18 the density is small what is the petrology of the silts ?

6 coring

Given the poor performance of the model to what level of confidence do you assess coring sites ?

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