Model: SSIIM model, Iffezheim reservoir (Rhine km 330 – 334)

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1. General Information	
Model name	SSIIM
Version	2
Author(s) / First publication	Olsen, N.R.B., "A numerical model for simulation of sediments movements in water intakes", Dissertation, The Norwegian Institute of Technologie, Trondheim, 1991.
Contact person (name, email)	Prof. Dr.-Ing. Nils Reidar Bøe Olsen, nils.r.olsen@ntnu.no
Institute	NTNU, Department of Hydraulic and Enviromental Engineering
Web site	Institute: http://www.ntnu.edu/ivm SSIIM can be found: http://folk.ntnu.no/nilsol/ssiim/
General modelling objectives	Three-dimensional modelling of hydraulics and sediment transport
Domain of applicability	short river reaches, reservoirs
KLIWAS contact (authority, name, email)	Federal institute of Hydrology, Gudrun Hillebrand (hillebrand@bafg.de)
Model adaption in KLIWAS	Modelling of reservoir sedimentation
Model coupling in KLIWAS	Indirect coupling, discharges from climate projections (PJ 4.01)
2. Model description	
Model type	physically-based
Temporal discretization	event-based (KLIWAS application: up to 3 months)
Temporal resolution	time step: 10 min, output time step: 12 h
Spatial discretization	Distributed, cell size about 8 x 8 m
Spatial resolution	length: 4 km, width: up to 1 km within levees, depth: water depth (up to ~12 m)
Dimension	3D
Short description of model structure detailing main function	Flow computation with subsequent computation of fractional sediment transport
Scheme of model structure	
Procedure of model parameter estimation	Manual calibration on ADCP-measurements of flow velocities and suspended sediment concentrations, and echo-soundings of bed level evolution
3. Model inputs / Model outputs	
List and characteristics of input variables	discharge time series, 1h time step; water level at weir; suspended sediment concentrations based on measurements, bed composition from measurements and preliminary model runs, 9 grain size fractions
List and characteristics of output variables	water level [m] flow velocities [m/s] bed shear [N/m²] bed evolution [m]
4. Examples of model applications	

Catchments, objectives etc.	Reservoir sedimentation, Reservoir flushing in Austria and Costa Rica
Results of existing comparisons with other models	Comparison studies exist (e. g. Haun et al. 2011 ; Stösser et al. 2009, doi:10.1016/j.advwatres.2009.11.001)
Application in the framework of KLIWAS	Process-based modelling of suspended sediment transport within the Iffezheim reservoir

5. List of 5 selected references

[1] Nils R. B. Olsen, " A three-dimensional numerical model for simulation of sediment movements in water intakes with multiblock option ", Department of Hydraulic and Environmental Engineering, The Norwegian University of Science and Technology, http://folk.ntnu.no/nilsol/ssiim/ , Trondheim, 2011.

[2] Hillebrand, G., Klassen, I., Olsen, N.R.B., Vollmer, S. (2012): Modelling fractionated sediment transport and deposition in the Iffezheim reservoir. 10th International Conference on Hydroinformatics HIC 2012, July 14-18, 2012, Hamburg.

[3] Hillebrand, G., Olsen, N. R. B. (2011): Towards modeling consolidation of fine sediments upstream of the Iffezheim barrage, Upper Rhine River, Germany. Proceedings of the 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, 6.-8. Sept. 2011, Peking, China.

[4] Klassen, I., Hillebrand, G., Olsen, N. R. B., Vollmer, S., Lehmann, B., Nestmann, F. (2011): Modeling fine sediment aggregation processes considering varying fractal dimensions. Proceedings of the 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, 6.-8. Sept. 2011, Peking, China.

[5] Haun, S., Dorfmann, C., Harb, G., Olsen, N. R. B. (2012): 3D Numerical Modelling of the Reservoir Flushing of the Bodendorf Reservoir, Austria. Proceedings of the 2nd IAHR Europe Congress, 27.-29. Juni 2012, München.