Model: SOBEK River

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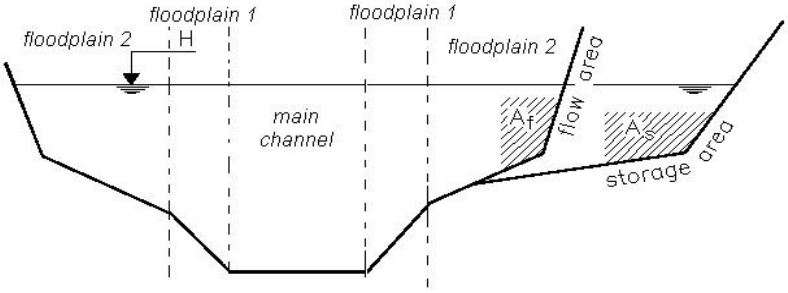
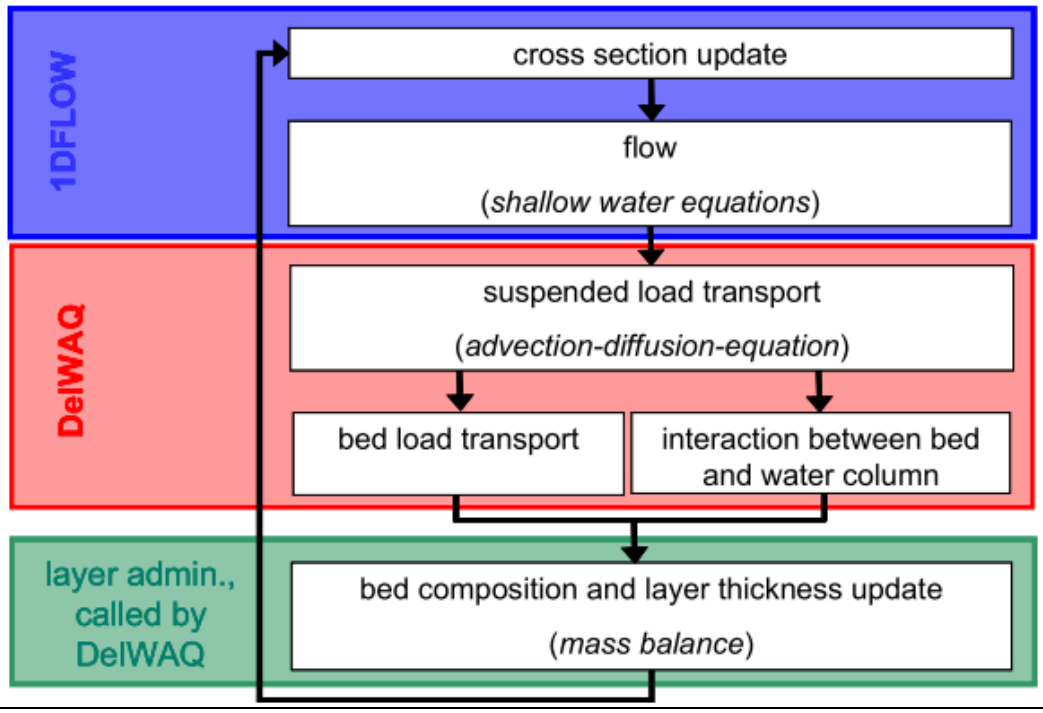
1. General Information	
Model name	SOBEK
Version	River
Author(s) / First publication	Deltares
Contact person (name, email)	Deltares, sobek.support@deltares.nl
Institute	Deltares
Web site	http://www.deltaressystems.com
General modelling objectives	simulate and solve problems in river management, flood protection, design of canals, irrigation systems, water quality, navigation and dredging
Domain of applicability	Applied worldwide Standard software in the Netherlands KLIWAS application domain: 1) Elbe, Usti-Geesthacht (distance between cross sections: approx. 200 m) Calibration period 1995 -2004 Validation period 2004-2007
KLIWAS contact (authority, name, email)	Federal Institute of Hydrology, Marc Roberts, roberts@bafg.de (focus on morphological modelling) Imke Lingemann, lingemann@bafg.de (focuson hydrodynamic modelling)
Model adaptation in KLIWAS	-
Model coupling in KLIWAS	Input data from applied hydrological models like HBV, HBV_D, LARSIM Output data for DST-model and HabMod-models
2. Model description	
Model type	physically-based
Temporal discretization	Continuous
Temporal resolution	different simulation timesteps possible e.g. 1h, 1d
Spatial discretization	Representative cross sections
Spatial resolution	river kilometer
Dimension	1D
Short description of model structure detailing	one-dimensional open-channel dynamic numerical modelling system which is capable of solving the equations that describe unsteady water flow, salt intrusion, sediment transport, morphology and water quality.

main function	Unsteady water flow is described by the De Saint Venant equations. Modelling of river regulation (impounded river systems, flood retention measures, …) is possible. The morphology is implemented in the existing water quality module DelWAQ by means of the DelWAQ Open Process library. Sediment-transport formulas are used to compute the transport capacity of bed material based on local flow conditions and available material in the bed layer.
Scheme of model structure	Scheme of cross section  
Procedure of model parameter estimation	manual calibration
3. Model inputs / Model outputs	
List and characteristics of input variables	Normally timeseries of inflows and downstream one discharge-water level relation as boundary conditions are needed The intial sediment distribution is based on the sediment databank SedDB of the Federal institute of Hydrology (BfG). The documented maintenance work of the Federal Waterways and Shipping Administration (WSV) e.g. dumping and dredging is implemented in the model. As of the year 2007 the averaged dumping and dredging masses (1995-2007) are carry forward in to account.

List and characteristics of output variables	Numerous output variables are available for different sections of the cross section, e.g. discharge [m³/s] water depth [m] flow velocity [m/s] bed movement [m] bed load [t] Substrate, grain size i, [cm]
4. Examples of model applications	
Catchments, objectives etc.	Elbe: hydraulic computation and process-based modelling of fractional sediment transport
Results of existing comparisons with other models	none
Application in the framework of KLIWAS	Assessment of climate change impacts on water depths, flow velocities, sediment transport in the Elbe basin
5. List of 5 selected references	
User manual SOBEK-River	