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# Comparison of different hydrodynamic models and their uncertainty in regard to different flood risk scenarios

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Generally, hydraulic modelling of river systems is primarily based on one (1D) and two dimensional (2D) models. Although the 2D-models are more than a decade in use and computer capacity is increasing, the 1D-modelling is commonly in practice.

Presently the application of a 1D-modell seems usable for a flood forecast because of short calculating times. A 2D-modell whereas seems to be more precisely and useful for calculation of flood areas and prognostic cases.

The main goal of this contribution is to compile the two different complex models in reference to their outcomes, calculating time, their application area in hydraulic simulation as well as the uncertainty of the results according to different flood risk scenarios.

As showcase area a 27 km long river section of the Oberer Main (Bavaria, Germany) is used. The applied hydraulic models are Hydro_AS-2D and Sobek-Rural (1D) by WL|Delft Hydraulics.

Alternative to the previous options is the coupled (1D/2D) modelling with Sobek-Rural as a third model option used. In this case the model consists of two layers. The first layer is the river channel that is calculated in 1D and includes all kinds of hydraulic structures (e.g. bridges, weirs . . . ). The second layer settles on the first and describes the flow over the land surface. That is defined by the digital terrain model (DTM) adjusted with flow blocking objects like dikes.