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Assessing the effects of modifications to river training structures using numerical modelling

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Speaker: Manuela Baron

Abstract: To maintain and optimize the river training works on the 70 km long stretch of the Danube River between the cities of Straubing and Vilshofen (see Figure 1), modifications on the training structures are being investigated and planned. The effect of such modifications on the water level, river bed and flow distribution can only be quantified using complex Hydro-numerical modelling.

For this purpose, a 2D-HN model for the 70 km river stretch, including floodplains, was set up and calibrated and validated using field measurements. The computational grid contains 2.6 million elements, with a minimum grid resolution of 3 m in the fairway and a maximum resolution of 25 m on the floodplains. Telemac2D Version 6P3r2 is used for the numerical simulations. Using the numerical model, the effect of typical modifications of the different river training structures can be investigated and quantified for the aforementioned parameters. Different variations (e.g. training structure dimensions) of the planned modifications were investigated. Additionally, ecological measures such as the restoration or inclusion of river islands, bank vegetation and flood routing channels (see Figure 2) were investigated. With many of the modifications, also the computational grid is adapted. The modular setup of the model allows the systematic assessment of the influence of the separate modifications.

The results of these hydrodynamic simulations will form the basis for ship navigability, morphologic and ground water investigations. The project illustrates the broad scope of the typical applications considered at the BAW.

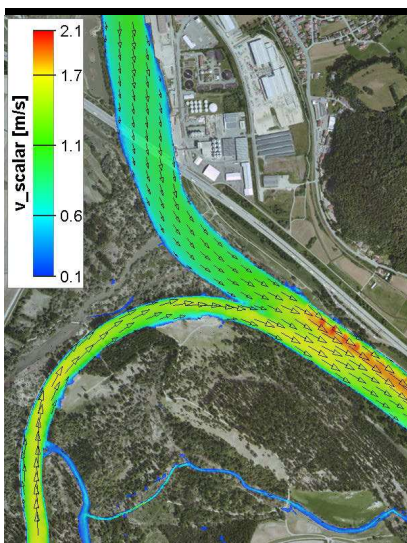


Figure 1: extract of the 2D-model near Deggendorf

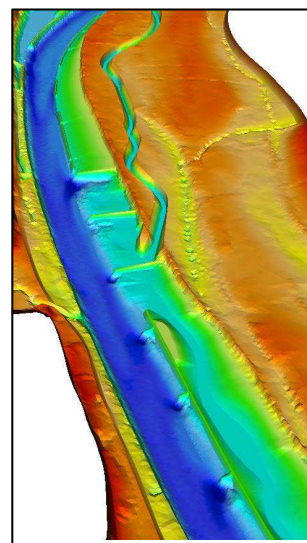


Figure 2: example of structures for river training