

Abstract of the PhD thesis

This thesis discusses the subject of the morphodynamics of dam reservoirs with particular focus on their backwater zones - areas near the estuary of the supplying river, the most sensitive to changes of external conditions: hydraulic and sediment transport ones. The dissertation is a "case study". As a pilot object, The Dobczyce Reservoir was selected. The main reason for this choice is that the chosen reservoir is the primary water source for the Cracow agglomeration.

The book presents the results of the author's granulometric tests for samples collected in the backwater of the reservoir, the results of other authors' research regarding deeper areas of the reservoir, as well as the distribution of the sediment fractions in the reservoir. The simulation tool used by the author is a hydrodynamic 2D model. It was used to numerically calculate the transport and deposition processes in given conditions of water discharge and water surface level. The water velocity field was simulated for specific (stationary or variable) conditions of the inflow discharge and the water level. On this basis, the author used the overlay sediment particle transport model (based on the Lagrange approach) to simulate the transport and segregation of particles of given diameters in the reservoir area. The significance of the reservoir operating conditions and the wind impact on transport and deposition processes in basins of the Dobczyce reservoir was examined. Finally, the results of the author's granulometric analyzes, as well as studies of other authors were all compared with the results of modeling.


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