

Effects of Selected Wastewater Management Scenarios on River Water Quality – Rudolf Bujok

Summary

For majority of running waters point pollution sources are the main sources of pollution. Knowing the water self-purification capacity one can modify the quality of waters through proper management of the discharged pollutants. This study focuses on identifying such solutions for pollutant discharge into the Kłodnica and Bytomka rivers, which would allow for achieving at least the III class of surface water quality. Simulation of selected wastewater management scenarios was carried out. The best solutions for the water environment were identified. Only environmental effects which resulted in improvement of the water quality were analyzed. The economical aspect of actions, the undertaking of which is indispensable for achieving the assumed goal, was not taken into account. The selection of the best solutions considering the cost effectiveness cannot be made until a feasibility study for particular undertakings has been completed. Salinity and biodegradable pollutants determined by BOD coefficient were taken into consideration. The simulation was carried out using an integrated simulation model IRM (Integrated River Model). In order to protect the river from excessive salinity the optimum solution for the Bytomka River would be desalination, whereas for the Kłodnica River – directing salty mining waters outside its catchment. For protection from biodegradable pollutants the only solution would be tightening the effectiveness criteria for municipal wastewater treatment. Meeting the minimum standards for wastewater treatment, currently obligatory in municipal wastewater treatment plants, will not ensure the assumed water purity level in these rivers.