ACTIVITIES OF COMBINED SEWER OVERFLOWS: A COMPARISON OF MEASURED AND COMPUTED DATA

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In order to relieve sewerage systems of excess stormwaters during heavy rainfalls overflow structures are necessary for a safe operation of urban drainage and wastewater treatment facilities. Overflow tanks have storage effects while pure overflows divide the discharges and route the excess water in the next watercourse. The outflows from combined sewage overflows can evoke significant effects on the receiving waters. Hydraulic effects ("hydraulic stress") result from the additional discharges, which are generally introduced at a single point. Toxic effects are caused by the pollutant load of the decanted discharges. In awareness of these effects an immission based consideration is required. The lack of reliable, measurement based data is obvious, although the generally accepted necessity of those is noted in recent research projects and regulations of public authorities. An immission based view necessitates data regarding the amount, number and duration of the overflows. Particularly with regard to the storm overflows this data is mostly achieved by means of computational simulations. The lack of measured data is the consequence of the adverse conditions in sewer pipes and the complex hydraulic situation at the overflow structures. Reliable data is necessary for the verification, the validation and the improvement of hydrological models.

Within the scope of a research project, carried out in the section for Hydrology And Water Management of the Technical University of Darmstadt, a storm overflow was equipped with measuring devices. Aims of the investigations were to discover the limiting boundary conditions in measuring sewer discharges and to record reliable data, concerning the overflow activities of the observed structure. The measured data should be compared with the results of the model SMUSI, which is an evaluation model of the public authorities in the federal state of Hesse, Germany.

It is the objective of the presentation to - specify the implementation and the performance of the measurement site - describe the processing and evaluation of the measuring data - compare the measured data with the computed data based on SMUSI simulations - discuss the opportunities and boundaries of measuring in urban hydrological systems regarding new approaches (measuring, modelling, managing) as well as the attainable accuracies of measurement.