

COUPLING OF RIVER QUALITY WITH A SURFACE FLOW MODEL FOR AN INTEGRATED ANALYSIS OF RECEIVING WATER QUALITY

J.-O. Delfs¹, F. Blumensaat², P. Krebs² and O. Kolditz^{1,2}

¹ Dept. of Environmental Informatics, Helmholtz Centre for Environmental Research - UFZ
Permoserstrasse 15, Leipzig 04318, Germany
e-mail: jens-olaf.delfs@ufz.de, web page: <http://www.ufz.de>

² Technical University of Dresden, Dresden, Germany

Summary. Sustainable river basin management often requires an integrated understanding of surface / subsurface flow and transport processes. OpenGeoSys (OGS) has been coupled with the EPA Storm Water Management Model (SWMM). SWMM, originally developed for runoff modeling in urban drainage systems, contains a flexible set of modeling capabilities, which also allow the description of non-uniform flow and the associated pollutant transport through irregular channels, such as river systems. One strength of OGS is its overland / soil / groundwater system modeling capabilities with Euler (finite element / volume) and Lagrangian (random walk particle tracking) methods. Combining the strengths of both models, it is so possible to perform an integrated analysis on pollution dynamics in receiving waters. The new coupled model has been applied to the Poltva basin in the Western Ukraine to evaluate impact of anthropogenic influences on river water quality. The considered river system is heavily affected by wastewater discharges (point sources) and agricultural emissions (diffusive sources), which causes severe water quality problems of transboundary relevance.