

Application of SWAT for modeling management scenarios in a large lowland watershed in Poland

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Through many years man is managing rivers to compensate for droughts, floods or intensification of agricultural and industrial production. Due to presence of diverse factors (changes in land use and production intensification, climatic changes) various management practises may have positive or negative influence on water quality. Existing monitoring programmes are often not sufficient to estimate impact of many investments/measures that are widely used in Poland, like retention reservoirs, subsoil irrigation systems, or changes in land use and agricultural practises, on water quality because of low frequency, irregularity or limited extent of the measurements. This is especially the case in the large lowland rivers, such as the Narew river located in North-East Poland, draining a 28,000 km² watershed, where this case study was performed. The aim of this study was to apply the watershed model, Soil & Water Assessment Tool for impact assessment of management scenarios developed with active stakeholders participation on water quality in a large river basin. An intermediate aim was development of these scenarios, describing future changes in land use, agriculture and water management, by formal linking of key river basin stakeholders with modellers. This case study demonstrates that parameters representing the driving forces used to quantify the scenarios are sensitive with respect to water quality constituents. Preliminary results of modeling showed that under a “greener” Sustainability Eventually scenario an improvement of water quality can be expected, in contrast to worsening of water quality under a market-oriented Economy First scenario.