

Document Control Sheet

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| <p>The deterministic water quality model QSim of the German Federal Institute of Hydrology was used to explore the influence of changing climatic and socio-economic conditions on the water quality of the Elbe River. Input data on future climate, land use and discharge situations were received from modelling results of partners in the cooperative project GLOWA-Elbe II. These data formed the basis for the simulation of scenarios. The longitudinal development of water quality parameters (e.g. algal biomass, nutrient concentrations) were simulated for a 700 km stretch of the Elbe from Obříství (Elbe-km -114) to Geesthacht (Elbe-km 585). The simulations included in-stream turnover of matter, transport and external climatic impacts. Under the regionalization of the A1B climate scenario, a substantial increase of the mean chlorophyll-a concentration (indicating algal biomass) is to be expected for the upper and central Middle Elbe, while only a slight increase might occur at the lower Middle Elbe. A reduction of nutrient inputs will have limited consequences on the resulting chlorophyll-a concentration in the Middle Elbe, because phosphorus limitation was hardly achieved in simulations even under strong reduction of P-inputs. However, lowered P-inputs will generally reduce the probability of extreme phytoplankton peaks. According to the model results it seems unlikely that a mean chlorophyll concentration of 52 µg/l (the upper level of the good ecological state according to the European Water Framework Directive) can be met, even if the designated concentration of 0.09 mg/l total P would be reached. Therefore, it is important to reduce P-inputs already in the headwaters of the catchment. If the algal concentrations developing there could be substantially reduced, a positive effect should be expected also in the lower sections of the Elbe.</p> | |
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