



Uncertainty assessment of nutrient loads and nutrient losses at catchment scale by detailed mechanistic models

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The Water Framework Directive demands the implementation of measures in order to reach the defined targets for water bodies. Modelling tools can be very helpful in identifying the sources of nutrient pollution and the magnitude of relevant pathways. Risk assessment is an important part of the characterisation process of catchments and in making judgements of the likelihood that water bodies will fail to meet defined environmental objectives. The NL-Cat modelling system which comprises of specialised modules for spatial discretisation, data processing, and mechanistic process simulation, has been applied to the Regge catchment in the Eastern part of the Netherlands to gain insight in the water concentrations and its associated uncertainty due to variability in parameters and input data. Uncertainties with respect to land use data, fertilizer and manure application rates and meteorological variation affects the variability of the results most. The uncertainty associated with nitrogen concentrations reduces with the reduction of future N-surpluses. However, the uncertainty associated with phosphorus concentrations increases in time despite the reduction of P-surpluses. Strengths and weaknesses of the use of detailed mechanistic models for an a priori evaluation of measures will be discussed.