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Monitoring response of surface water concentrations to land use in a Dutch polder system

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The impact of fertilizer strategies on the water quality of Dutch surface waters is hard to quantify. For a proper reasoning of efficient measures it is essential to enable apportionment of the total loads to different diffuse and point sources of subsystems for land/soil and water. This apportionment strongly depends on a proper description of flow paths and travel times of water and fertilizer remains (such as nitrate and phosphate) that leach from the soil surface towards groundwater and surface water.

A phased systematic approach is applied to 4 catchments in The Netherlands. These catchments differ strongly in soil type and interaction with regional groundwater flow. This paper describes one catchment, a typical Dutch polder “De Krimpenerwaard”, having peat soils and fully controlled water management. A brief overview of the phased approach will be presented which implies an increase in spatial and temporal detail using dynamic models for water and nutrient flow in soil and surface water systems.

The monitoring approach tries to optimize the delicate balance between measurements and modelling. The increasing use and availability of regional data indicated important shortcomings in modelling: in the peat soils of this polder the combination of rapid transport processes and the lack of knowledge about the vertical distribution of nutrients resulted in an underestimation of the leaching of nutrients. The necessity of additional measurements is discussed and a proposal on monitoring progress for the coming year will be presented.