



1 Ranking the factors controlling the spatio-temporal variability of nitrate retention in the Seine Basin

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Riparian wetlands, located at the interface between the catchment and the rivers, can play an important role in the control of water quality by reducing diffuse pollution coming from the watershed. In these buffer environments, nitrate concentrations are significantly reduced by plant uptake but also by denitrification. If there is a consensus about the existence of nitrate retention in riparian zones, it remains difficult to quantify, at all scales from the local one to that of regional watersheds.

Our overall objective is to identify and rank the factors controlling the spatio-temporal variability of nitrate retention in the Seine Basin (78 650 km²). To this end, we have computed retention rates by means of 8-year nitrate budgets in the riparian zone of 180 independent catchments that are defined by upstream and downstream stations where in-stream nitrate concentration measurements are available. Groundwater nitrate concentration is extrapolated from a network of 3265 wells. Subsurface nitrate concentration is estimated based on land use. The surface runoff and the base flow combined to these concentrations to deduce nitrate fluxes reaching the riparian zones are given by the hydrogeological model MODCOU developed for the Seine river basin.

Firstly, the retention rates allowed us to study the spatial variability of nitrate retention in the Seine river basin. They have a mean of 20 % and are spatially organized in the Seine watershed with higher values in the upstream part of the basin. Secondly, statis-

tical analyses of the resulting rates were performed to identify the factors controlling the spatial variability of denitrification in riparian zones and related streams. The first results confirm the importance of the type of alluvial deposits, the order of the basin and the land use to the control of the denitrification process in the Seine River basin.