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Assessment of the factors controlling nitrate retention in riparian zones in the Seine river basin

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Riparian wetlands are important ecosystems able to achieve many environmental functions related to river functioning. Their location at the interface between terrestrial and aquatic environments allows them to significantly reduce nitrate concentrations in subsurface water flowing through them.

Our main objective was to determine and hierarchize the factors controlling nitrate retention in the riparian zones of Seine watershed (78 650 km^2). The nitrate retention was characterized by performing nitrate budgets for watersheds having measurements of flow rate and nitrate concentration at the outlet. The retention rate in riparian zones is given by the difference between the nitrate flux exported by the river and the nitrate flux coming from the watershed to the riparian zone (along with surface runoff and base flow) after correction for point-source input. These calculations were realised in more than 250 surveyed catchments (mean area = 1472 km^2) and for different step times over a 10-year period.

Firstly, the retention rates allowed us to study the spatial variability of nitrate retention in the Seine river basin and its variability in time, both seasonally and interannualy. Secondly, we used statistical approaches to test the relationships between the retention rates and numerous factors likely to influence them, such as the geomorphological and geochemical characteristics, climatic conditions or land use.