

# **Flux and Fate of Silver Nanoparticles in Small Watersheds Under Different Land use**

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According to recent estimates, it is expected that global production of functionalized nanoparticles will increase to 58,000 t / y in 2020. It is therefore inevitable that a significant proportion of manufactured nanoparticles will be disseminated in natural environments, and may eventually impact ecosystems. Several studies have calculated the theoretical fluxes of nanoparticles in the environment, revealing the existence of potentially problematic concentrations for several compartments. However, these scenarios are very difficult to confirm by field observations due to the difficulties of detecting these nano-objects and the complexity of natural environments.

The work presented here aims to highlight the use of original nanoparticle quantification techniques in Seine river's sub-watersheds. In particular, the technique of spICPMS (single particle counting by ICP-MS), applied to nano-Ag, allowed to detect and quantify their presence in waters draining three zones with contrasting soil occupations (urban, agricultural and forestry). The results obtained during sampling campaigns carried out over a year show nanoparticle number concentrations and a different size distribution for these three types of soil occupation. The information obtained allows us to refine our understanding of the contribution of these three major types of sources to nanoparticle flows in the Seine basin, based on watersheds that are very well characterized from a physico-chemical point of view.