



## **Loss rates of biocides can exceed those of pesticides**

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Biocides and pesticides are used to control unwanted organisms in urban and agricultural areas. From there they can be mobilized and transported to surface waters. Several national consumption studies have shown that urban and agricultural use may be in the same range. However, it is difficult to judge whether this results in similar loadings of surface waters because there is a lack of sound, comparative studies addressing urban and agricultural losses simultaneously.

The aim of this study was to relate the biocide and pesticide loads found in surface waters to their respective urban and agricultural usage. To simultaneously assess these loss rates, we conducted a comprehensive field study in a catchment with four sub-catchments with different degrees of urban and agricultural land use. Besides surface waters, we also studied the only wastewater treatment plant, a combined sewer overflow and a storm sewer within the area. Rain events were sampled at high temporal resolution from March to November, 2007.

Despite substantially lower amounts used, the measured loads of urban biocides were in the same range as the most widely-used agricultural pesticides. The lower usage was compensated by urban loss rates that were up to ten times higher than agricultural ones (0.4 to 10.1% for urban, 0.4 to 0.9% for agricultural compounds). This study demonstrated that in catchments with mixed land use, mitigation strategies have to pay sufficient attention to both urban and agricultural sources.