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Assessing metaldehyde concentrations in surface water catchments and implications for drinking water abstraction

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Metaldehyde is an active ingredient in agricultural pesticides such as slug pellets, which are heavily applied to UK farmland during the autumn application season. There is current concern that existing drinking water treatment processes may be inadequate in reducing potentially high levels of metaldehyde in surface waters to below the UK drinking water quality regulation limit of 0.1 μg/l. In addition, current water quality monitoring methods can miss short term fluctuations in metaldehyde concentration caused by rainfall driven runoff, hampering prediction of the potential risk of exposure. Datasets describing levels, fate and transport of metaldehyde in river catchments are currently very scarce.

This work presents results from an ongoing study to quantify the presence of metaldehyde in surface waters within a UK catchment used for drinking water abstraction. High resolution water quality data from auto-samplers installed in rivers are coupled with radar rainfall, catchment characteristics and land use data to i) understand which hydro-meteorological characteristics of the catchment trigger the peak migration of metaldehyde to surface waters; ii) assess the relationship between measured metaldehyde levels and catchment characteristics such as land use, topographic index, proximity to water bodies and runoff generation area; iii) describe the current risks to drinking water supply and discuss mitigation options based on modelling and real-time control of water abstraction. Identifying the correlation between catchment attributes and metaldehyde generation will help in the development of effective catchment management strategies, which can help to significantly reduce the amount of metaldehyde finding its way into river water. Furthermore, the effectiveness of current water quality monitoring strategy in accurately quantifying the generation of metaldehyde from the catchment and its ability to benefit the development of effective catchment management practices has also been investigated.