



Does agricultural land use homogenize organic matter properties?

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Recent studies suggest that agricultural land uses modifies organic matter properties in agricultural soils and streams: agricultural organic matter shows little spectroscopic variation in space and time and a high content of tryptophan-like fluorescence compared to forest organic matter. However, detailed studies of between agricultural catchment variation in organic matter quantity and quality are missing.

Our study evaluates this variation for 8 agricultural catchments in Sweden over 2 years. Our results for agricultural catchments, under similar climatic and land use conditions show that 1) there is a small between catchment variation in organic matter quantity (measured as total and dissolved organic carbon TOC and DOC) and quality (measured with a range of spectroscopic parameters) compared to other water quality parameters and 2) observed spatial and temporal differences in organic matter properties can be explained by differences in catchment geology controlling dominant flow pathways and seasonal differences in hydrological forcing (wet and dry conditions). We evaluate the observed patterns in the context of the long-term changes in organic carbon, water quality and weather and hydrological forcing and show how organic matter quantity and quality could change under future climatic scenarios.

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