



Comparison of high time frequency of dissolved organic matter fluorescence characteristics from an urban stream and a canal

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It is important to analyze organic matter variability at high temporal resolution in order to detect episodic pollution, determine short-term variations in chemical and ecological function and to improve river carbon budget. Yet, continuous monitoring of DOM character and concentration at hourly resolution are rare, due to the absence of in-situ or continuous instrumentation that can collect fluorescence data. In this study, a two-week experiment has been performed on riverine DOM sampled from the Bournbrook stream, and the adjacent Birmingham and Worcester Canal, Birmingham, UK in order to determine the effect of regulation on DOM characteristics. Spectrophotometric (fluorescence, absorbance) and physiochemical (dissolved organic carbon, electrical conductivity, pH) parameters have been measured at hourly frequency. Sub-daily variations have been observed in stream samples for both organic matter concentration and characteristics, triggered by rain and snow events. Organic carbon concentration increased, with an associated increase in intensity of both humic-like and tryptophan-like fluorescence. On the contrary, the regulated flows of the canal lead to little variability in water quality over the study period, and no correlation was observed between organic matter fluorescence and the quantity of precipitation. Compared to the Bournbrook stream, the canal water has significantly higher intensity of tryptophan-like fluorescence. The results are interpreted with respect to water quality and Water Framework Directive regarding artificial and heavily modified water bodies in order to assess the ecological potential and status of the studied ecosystems.