Geophysical Research Abstracts
Vol. 19, EGU2017-14445, 2017
EGU General Assembly 2017

Temperature and turbidity effects on in-situ field fluorometer measurements of conservative (Uranine) and reactive (Resazurin and Resorufin) stream tracers

Nicolai Brekenfeld (1,2), Phillip Blaen (1,2), Sophie Comer (1,2), Stefan Krause (1,2)

(1) University of Birmingham, University of Birmingham, School of Geography, Birmingham, United Kingdom (p.j.blaen@bham.ac.uk), (2) Birmingham Institute of Forest Research (BIFoR), University of Birmingham, Edgbaston, Birmingham, United Kingdom

There is growing interest in the co-application of conservative and reactive 'smart' tracers to characterise solute transport dynamics and metabolic activity at sediment-water interfaces in stream ecosystems. In-situ field fluorometers facilitate such experiments by providing continuous measurements of tracer concentrations at high temporal resolutions (i.e. seconds). Here, we show that field fluorometer measurements of conservative (Uranine) and reactive (Resazurin and Resorufin) tracers are highly sensitive to the effects of both temperature and turbidity. Under controlled laboratory experiments, uncorrected field fluorometer measurements responded linearly to variations in temperature. However, strong non-linear behaviour was observed with respect to changes in turbidity, most likely due to a combination of optical scattering at lower turbidity concentrations and fluorescence quenching at higher turbidity concentrations. Our results show that correction of raw field fluorometer measurements for both temperature and turbidity is necessary to ensure valid comparisons between sites and through time.