



## **On the calculation of the spatial distribution of inflow to a river reach through the analysis of a tracer experiment with uncertainties.**

P. Smith (1), K. Beven (1), S. Dean (1), J. Freer (1), F. Gallart (2), J. Latron (3), R. Williams (1)

(1) Lancaster Environment Centre, Lancaster University, UK, (2) Institute of Earth Sciences 'Jaume Almera' (CSIC), Lluís Solé Sabarís s/n, E-08028 Barcelona, Spain, (3) Pyrenean Institute of Ecology, CSIC Avda Montañana 1005, 50059 Zaragoza, Spain  
(p.j.smith@lancs.ac.uk)

This presentation introduces work on the use of steady state tracer studies for the inference of spatial patterns in the incremental lateral inflows to a stream. A simple parametric representation of the errors within the field data is formulated. A computational algorithm for the calculation of the spatial inflow pattern when using the error representation is proposed for steady state conditions. Further to this a parsimonious extension to non-constant load conditions is presented. Example calculations based upon field work carried out at the Can Vila research catchment near Vallcebre in Cataluña Spain are presented. The results of this analysis indicate that the extension to non-constant load conditions is of practical use. This methodological extension allows the use of constant injection tracer studies for the determination of source areas for reaches where the requirement to reach steady state was, in the past, prohibitive.