Quantifying hyporheic exchange coefficients using the EROSIMESS-system

ABSTRACT

This presentation describes a new laboratory method for studying hyporheic exchange, through the use of a modified EROSIMESS-System (erosimeter). This method requires much smaller volumes of water and sediment than traditional re-circulating flume studies, which reduces the testing time and allows a wider variety of parameters to be investigated in one test series. The erosimeter allows full scale study of hyporheic exchange, but with reduced quantities of sediment and fluid. The technique typically has a reduced time scale for each test, allowing a wider variety of conditions to be examined within one test series. The experimental exchange coefficients obtained with the erosimeter are compared with previous experimental work, obtained with laboratory flumes, through an effective diffusion scaling relationship. The experiments presented compare well with the previous laboratory flume studies, demonstrating the validity of the erosimeter technique for quantifying hyporheic exchange.