



Variability in the Permeability of Streambed Sediments: A Critical Variable Controlling Hyporheic Zone Processes

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Streambed sediment permeability is a major control on exchange across the sediment-water interface and both flux rates and residence times within the hyporheic zone. Whilst there has been much effort to understand hydraulic attributes of river channels affecting surface flow, there has been little attention given to this important hydraulic property of the hyporheic zone. This paper reviews existing knowledge of streambed permeability, patterns of variation in time and space and the factors influencing these patterns. This review suggests a new conceptual model of streambed permeability and its variation and dynamics both within and between catchments. We test this model using observation of streambed permeability in 101 river reaches in France. Based on an improved understanding of variation in streambed permeability we consider implications for hyporheic zone processes and their variation through river basins.