

How Old Is Your Streambed?

Michael Stewardson

The University of Melbourne, Melbourne, Victoria

Abstract

The recirculation of streamflow through streambed sediments contributes to a variety of ecosystem functions including retention of nutrient and contaminants and the provision of permanent or temporary aquatic habitats. Whilst these functions have received a lot of attention in the literature and river management practice, the bio-physical nature of the sediment matrix, including both its spatial variability and its evolution with time is often neglected. This paper makes the case that river managers should pay attention to the evolving condition of the river sediments. A conceptual model is presented for the evolution of streambed sediment including: resetting with bed mobilisation; subsequent physical and biological clogging; and interactions with bioturbation by animals and plants. The conceptual model is tested in an empirical analysis of streambed surveys in over 100 river reaches. The conceptual model has important implications for management of flow regimes and river channels.