

Testing The Feasibility Of Sediment Replenishment From Stormwater Systems To Urban Streams

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Abstract

Established urban catchments often result in much greater flow to receiving streams than prior to urbanisation, but they can also lead to reduction in coarse-grained sediments to streams. The resulting loss of coarse-grained sediments (e.g. sands, gravels etc.) can have negative consequences for aquatic ecosystems, including reduced foraging and refuge for macroinvertebrates and fish. Stormwater harvesting and treatment systems often exacerbate the problem. Gross Pollutant Traps (GPTs) are generally intended to trap mostly coarse-grained sediments and further starve streams of coarse-grained sediments. Since coarse-grained sediments are reduced in urban streams (Vietz et al., 2014) but are ecologically important (Walsh et al., 2005), and transfer less contaminants compared to fine sediments (Walsh et al., 2005; Barnard et al., 2013; Houshmand et al., 2014), an opportunity exists to let sediments bypass GPTs to the stream.

In this study, we introduced coarse-grained sediments trapped in the Wicks Reserve GPT to the Dobsons creek in Victoria to investigate the fate of them in the stream below the GPT. After releasing sediments into the creek, sediment movement and load were monitored using transducer plates in the bed of the stream. The data demonstrates movement of the augmented bed sediments relative to flow. This study will inform design of stormwater management systems that better manage sediment and demonstrates the feasibility of replenishing sediment in urban streams whilst reducing maintenance costs to stormwater system managers.