

Public Abstract

First Name:Dandan

Middle Name:

Last Name:Huang

Adviser's First Name:Jason

Adviser's Last Name:Hubbart

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title:Quantifying Stream Bank Erosion and Deposition Rates in a Central U.S. Urban Watershed

Stream bank stability is gaining increasing attention in part because stream bank erosion can contribute as much as 80% of suspended sediment to streams, particularly in urbanizing watersheds. Stream bank erosion study sites were located in a lower reach of the Hinkson Creek Watershed located in Boone County, Missouri, USA. Streambank erosion and deposition rates were quantified using the erosion pin method comparing a remnant Bottomland Hardwood Forest (BHF) streambank to an Agricultural (Ag) streambank (922 m apart). Ten erosion pin plots ($n = 342$ pins) were installed that spanned the range of bank geometric and vegetation cover variability. Results indicated that during a drier (762 mm) than average (10yr avg=1077 mm) rainfall year 15.6 and 177.7 tonnes of soil erosion occurred on the right stream bank alone of the BHF and Ag sites respectively (Water Year 2011). Average erosion depth of the BHF and Ag was 18 and 112 mm/yr respectively. The greatest average depth of erosion occurred during the winter season (44.7 mm), followed by summer (13.1 mm) and spring (6.3 mm), fall had the lowest average erosion rate (1.1 mm). The stream bank erosion contributed approximately 67% of channel suspended sediment loading over WY 2011. Results hold important implications for land-use and land managers wishing to improve land-use practices, water quality and natural resource sustainability in dynamic urbanizing watersheds.