SCCWRP Annual Report 2011

Framework and tool for rapid assessment of stream susceptibility to hydromodification

Brian P. Bledsoe[1], Eric D. Stein, Robert J. Hawley[1]* and Derek Booth[2]*

[1]*Colorado State University, Department of Civil and Environmental Engineering, Fort Collins, CO*

[2]*University of California, Bren School of Environmental Science and Management, Santa Barbara, CA*

**Sustainable Streams, LLC, Louisville, KY*

ABSTRACT

Changes in streamflow and sediment loading associated with urban development have the potential to exacerbate channel erosion, and result in impacts to wetland, riparian, and stream habitats, as well as infrastructure and property losses. The typical "one-size- fits-all" management prescription of flow control with retention or detention basins has not been wholly effective, pointing to a need for improved management strategies and tools for addressing 'hydromodification.' We present an approach for developing screening-level tools for assessing channel susceptibility to hydromodification, and describe a novel tool for rapid, field-based assessments of the relative susceptibility of stream segments. The tool is based on the results of extensive field surveys which indicate that susceptibility is the driver of channel response, not the magnitude of urbanization. A combination of relatively simple, but quantitative, field indicators are used as input parameters for a set of decision trees that follow a logical progression in assigning categorical susceptibility ratings to the channel segment being assessed. The susceptibility rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream segment type. The screening approach represents a critical first step toward tailoring hydromodification management strategies and mitigation measures to different stream types and geomorphic settings.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2011AnnualReport/ar11_025_047.pdf