

A Review of the Impacts of Urbanization on River Morphology: Current Knowledge, Industry Practices, Challenges, and Future Opportunities

**Ben D. Plumb¹,
Jeff P. Hirvonen²,
Peter J. Thompson³**

¹*Fluvial Geomorphologist, GeoProcess Research Associates Inc., Ottawa, Canada*

²*Principal, GeoProcess Research Associates Inc., Toronto, Canada*

³*Hydrologist, GeoProcess Research Associates Inc., Hamilton, Canada*

The impacts of urbanization on river morphology have been well documented and remain an active research topic. Historically, studies focused on the impacts of urbanization to watershed hydrology, work which helped inform traditional stormwater management techniques. Also, research on sediment production due to urban development has guided erosion and sediment control practices commonly employed today.

The most commonly observed morphological adjustment is channel enlargement, by both incision and widening as the river adjusts to its new hydrologic and sediment regimes. These types of adjustments and their related processes are associated with often-negative consequences, and our efforts to combat these effects have changed the way watershed planning is undertaken. This has occurred through advances in stormwater management, river rehabilitation and erosion assessment techniques.

Even with advances in watershed planning and engineering practices related to urban river management, challenges persist in urban river rehabilitation, target morphologies in hydromodified regimes, erosion threshold assessment and stormwater management. This presentation summarizes our current knowledge of urban river processes, industry practices and associated challenges. It also highlights some current research avenues and opportunities to further advance urban river management practices.

Biography

Dr. Ben Plumb is a fluvial geomorphologist at GeoProcess Research Associates Inc. He has been working in the fields of fluvial geomorphology and river rehabilitation since 2008. He recently completed his doctorate in civil engineering at the University of Waterloo where he specialized in fluvial geomorphology, sediment transport and river engineering with research focusing on the impacts of urbanization on bed morphology in gravel-bed rivers.