



## **Modelling Low Impact Development Potential with Hydrological Response Units**

Marija Eric<sup>1</sup>, Celia Fan<sup>2</sup>, Dr. Darko Joksimovic<sup>3</sup>, Dr. James Y. Li<sup>4</sup>

<sup>1</sup> Ryerson University, Toronto, Canada, meric@ryerson.ca

<sup>2</sup> Ryerson University, Toronto, Canada,

<sup>3</sup> Ryerson University, Toronto, Canada, darkoj@ryerson.ca

<sup>4</sup> Ryerson University, Toronto, Canada, jyli@ryerson.ca

### **ABSTRACT**

Evaluations of benefits of implementing Low Impact Development (LID) stormwater management techniques can extend up to a watershed scale. This presents a challenge for representing them in watershed models, since they are typically orders of magnitude smaller in size. This paper presents an approach that is focused on trying to evaluate the benefits of implementing LIDs on a lot level. The methodology uses the concept of Urban Hydrological Response Unit (UHRU) and results in developing and applying performance curves that are a function of lot properties to estimate the potential benefit of large scale LID implementation. Lot properties are determined using a municipal Geographic Information System (GIS) database and processed to determine groups of lots with similar properties. A representative lot from each group is modelled over a typical rainfall year using US EPA SWMM to develop performance functions that relate the lot properties and the change in annual runoff volume and corresponding Phosphorus loading with different LIDs implemented. The results of applying performance functions on all urban areas provide the potential locations, benefit and cost of implementation of all LID techniques, guiding future decisions for LID implementation by watershed area municipalities.

### **KEYWORDS**

Low Impact Development, Urban Hydrological Response Unit, watershed model