

## **Restoring the Connection between Creek and Lake: Fresh Water Estuarine Creation in Mississauga**

**Jeffrey Doucette<sup>1</sup>,  
Kenneth Dion<sup>2</sup>,  
Sally-Beth Betts<sup>3</sup>**

<sup>1</sup>*GHD Limited, Mississauga, Canada*

<sup>2</sup>*Toronto and Region Conservation Authority, Toronto, Canada*

<sup>3</sup>*Credit Valley Conservation, Mississauga, Canada*

The eastern Mississauga waterfront, in the Region of Peel, currently supports little habitat for wildlife. This area was subject to extensive lakebed mining in the 1800s and early 1900s, while the majority of the remaining terrestrial and riverine habitats were removed due to past and current industrial activity. Public access is also not permitted along the waterfront in the area.

The Lakeview Waterfront Connection Project will create 26 hectares of new conservation land to replace the existing degraded shoreline and nearshore areas, with a complete coastal ecosystem, consisting of coastal wetlands, meadows, upland forest, and stream enhancements. The project is a joint effort between the Region of Peel and Credit Valley Conservation with Toronto and Region Conservation Authority providing technical expertise.

The new conservation land provides the opportunity to extend and restore the outlets for Serson and Applewood Creek. Serson Creek as it approached Lake Ontario was divided into two different paths. Flows below the 2-year event were directed through a culvert under the GE Booth Wastewater Treatment Plant (WWTP) and discharged at the edge of the plant to an area just behind the existing beach. Flows greater than the 2-year event were directed down a narrow v-shaped stormwater channel between the Ontario Power Generation Lands and the WWTP. Development of the Lakeview Waterfront Connection provides an opportunity to “daylight” Serson Creek by diverting the base and stormflows through a widened and naturalized stormwater channel, before transitioning the flows through a constructed naturalized estuarine system, complete with levees and adjoining coastal wetlands in the new land creation area of the project.

The project provides unique opportunities and constraints such as creating the initial land mass for the estuary area, establishing links to adjacent proposed wetlands, accommodating fluctuating lake levels, improving habitat diversity, conveying large flashy flood events, maintenance of sediment transport and integration with the shoreline design. Design details included shoals and pools, high estuary hooks, rock habitat features, integrated wetland inlets and levees, and root wad bank protection.

Construction provides distinct challenges with respect to water level fluctuation, severe wave conditions, water management, material supply, and restoration phasing.

Implementation of key design features is presented as well as examples of solutions to issues faced in this unique environment.

### **Biography**

Jeff is a geomorphologist working for GHD Limited. He has an extensive background in both coastal and fluvial geomorphology having conducted studies on beaches in Australia, in hydraulic laboratories in Scotland and on rivers in Canada.

Ken is a Senior Manager with the Project Management Office at Toronto and Region Conservation Authority. He has extensive experience managing large-scale environmental restoration, flood protection, and shoreline projects, including the Don Mouth Naturalization and Port Lands Flood Protection Project and the Lakeview Waterfront Connection Project.

Sally-Beth Betts is a fluvial geomorphologist at Credit Valley Conservation. Her main areas of work include undertaking catchment scale surveys to determine baseline geomorphological conditions, river and wetland restoration and geomorphological assessments.