

## **Transient storage and release of sediment and phosphorus in a small urban impoundment**

**N. McLELLAN<sup>1</sup>, L. GRAY<sup>1</sup>, D. ALLIN<sup>2</sup>, K. DAMUDE<sup>2</sup>, A. DIFEBO<sup>2</sup>,  
K. McLEAN<sup>2</sup>, E. SARARAS<sup>2</sup>, M. STONE<sup>2</sup> & J. PRICE<sup>2</sup>**

*1 Department of Civil and Environmental Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada*

*2 Department of Geography and Environmental Management, University of Waterloo, Ontario N2L 3G1, Canada*

[mstone@uwaterloo.ca](mailto:mstone@uwaterloo.ca)

**Abstract** A mass balance approach was used to quantify concentrations and loads of suspended solids and phosphorus (P) at the inflow and outflow of Laurel Pond, a small river impoundment in an urbanized watershed in Waterloo, Ontario, Canada, over a range of hydrological conditions. During baseflow and higher magnitude flow conditions, Laurel Pond was a sink for both sediment and P. However, 8.4 t of sediment and 8.6 kg of P were released from Laurel Pond during drawdown. Concentrations of sediment and P were positively correlated but inversely related to pond depth. A threshold water level was observed in the pond, below which the majority of sediment and P were released. During the Laurel Pond drawdown, 94% of suspended solids and 100% of TP measurements at the pond outflow exceeded Ontario Provincial Water Quality Objectives of 25 mg L<sup>-1</sup> and 30 µg L<sup>-1</sup>, respectively.

**Key words** urban impoundments; sediment; phosphorus; drawdown