

Potential Impacts of Sediments and Runoff from Urban Infrastructure on Water Quality in Lake Ramsey, Sudbury.

M. Jakkola, C. Simonato, G. Spiers, D. Pearson, J. Richard and C. Hawson
Centre for Environmental Monitoring, MIRARCO, Laurentian University, Sudbury, ON. P3E 6B5

Roads and parking areas for vehicles provide impervious surfaces that are key catchment areas for the accumulation of dusts that can include oil, dirt, grease and metals adsorbed on the surfaces of particles. Of particular interest are the contaminant metals that originate from a variety of sources including traffic debris, local industrial processes and natural weathering processes on the infrastructure surfaces. These urban sediments may eventually be transported through urban storm water management systems to urban lakes, rivers and groundwater. High intensity storms or spring snow melt in northern regions increase the transport of aerosol particulate and vehicle deposited sediments and associated contaminants.

Sediment from roads and parking lots was collected from the Ramsey Lake watershed in Sudbury, Ontario, Canada. A vacuum cleaner with a High Efficiency Particulate Absolute (HEPA) filter was used to collect sediment samples from the sites. Sediments were analyzed for particle size, mineralogical and chemical characteristics. Sub-samples of the sediments were leached with a series of mild extractants designed to mimic snowmelt and regional rainwater to evaluate the potential dissolved metal load that can be transported from the asphalted surfaces to regional surface water bodies. The leachates were analyzed by ICP-AES and ICP-MS to determine dissolved metal concentrations. Both pH and chloride concentration of the leachates were also determined. For chemical analysis of the solid phase by XRF, the sediments were separated into fine (<0.63 mm) and coarse (< 2.00 mm, >0.63 mm) fractions. These particle size separates were further divided into magnetic and non-magnetic fractions.

This poster will highlight the results obtained in this study. The results will be compared with the regulatory guidelines for both sediments and aquatic discharges to receiving waters. Potential methods for minimizing contamination of regional drinking waters from this diffuse source will be highlighted.