



WQI Monitoring Program Technical Report

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Executive Summary

2007 is the seventh year of the Muskoka Lakes Association's long-term commitment on behalf of the community to monitoring, protecting and enhancing the environmental resources of the Muskoka Lakes area. The Water Quality Initiative (WQI) is a formal scientifically-based monitoring program that complements monitoring programs of other agencies. Scientific protocols were originally developed by Dr. Neil Hutchinson of Gartner Lee Ltd. The MLA has been co-operating with Citizens' Environment Watch (CEW), an Ontario-based environmental charity, to deliver the monitoring program and develop local remedial action plans based on the results of the monitoring program since the fall of 2006.

Results of the WQI monitoring program are presented on an area-by-area basis in the WQI Summary Report. This Technical Report describes scientific methods, quality control measures and other technical information. It also outlines the general research conclusions. Site-by-site and year-by-year data is housed and accessible to the public online at both the MLA's (<http://www.mla.on.ca>) and CEW's (<http://www.citizensenvironmentwatch.org>) websites.

Nine community groups were affiliated with the MLA through the WQI in 2007, including two new Affiliates (Muldrewe Lakes Association and Star Lake Woods Association). Monitoring efforts grew slightly to 162 sites monitored by over 133 volunteers.

A pyramid system of volunteers was created in 2007 to help with "succession planning" and avoid volunteer burn-out. Casual volunteers were able to assist, regular Trained Volunteers were trained in the protocols by CEW staff and Team Leaders were trained to manage their team and analyze bacteria samples. This pyramid significantly increased the efficiency of the monitoring program, reducing staff time and associated costs. This also gives keen volunteers the opportunity to take on more responsibility and provides multiple commitment levels so anyone interested may volunteer.

As in previous years, the WQI monitoring program collected eight biweekly samples between Victoria Day and Labour Day. These samples were analysed for phosphorus concentration, total Coliform, *E.Coli*, water clarity and temperature. A Secchi depth protocol was added in 2007, as an alternative to turbidity for measuring water clarity. Total Coliform and *E.Coli* samples were analysed by volunteers or CEW staff using *ColiPlates*.

The WQI operates in a rich context of water quality monitoring. The most important and influential of local monitoring programs is the District of Muskoka's Lake System Health Monitoring Program, which informs all local planning regimes including mechanisms of landscape conservation and development control. This monitoring program classifies lakes based on their observed phosphorus load as compared with thresholds established by the District. A lake's classification determines its level of protection and its need for remediation.

The data collected in the WQI is primarily used to identify causes of problems identified in areas that have been classified as over-threshold for phosphorus concentration. These results are reported as part of three Remedial Action Programs (RAPs) of the MLA. The more general research purpose (discussed in this report) is to compare all deep water phosphorus concentration data to phosphorus threshold levels and subsequently help the District of Muskoka as well as neighbouring jurisdictions to ensure all areas are being appropriately protected through development regulations and enhanced through RAPs. WQI monitoring is therefore concentrated in

1. lakes and bays with problems identified by DMM;
2. lakes and bays where past WQI data indicates a problem; and
3. lakes and bays where DMM does not monitor.

Analysis (Section 5.1.1) shows that two WQI sampling areas should be considered for designation as over-threshold, two areas should be monitored by the District, three areas should have thresholds calculated and two further areas in Sequin Township may be rich in nutrients and development regulations should be considered by that jurisdiction.

Several recommendations are made for consideration in 2008. These recommendations (Section 6) include requiring a Team Leader to lead each volunteer team, improving Team

Leader training and using secchi depth as the standard measurement of water clarity while continuing to measure turbidity at nearshore zone sites in sampling areas that are subject to a RAP.