



ANNIVERSARY EDITION!
Kawartha Lake Stewards Association



2025 Annual Lake Water Quality Report
Looking Back, Moving Forward:
25 Years of Kawartha Lakes Stewardship

MAY 2026

Kawartha Lake Stewards Association 2025 Annual Lake Water Quality Report

LOOKING BACK, MOVING FORWARD: 25 YEARS OF KAWARTHA LAKES STEWARDSHIP

The Kawartha Lake Stewards Association (KLSA) is a volunteer-driven, non-profit organization of seasonal and year-round residents in the Kawartha Lakes region. The Association's programs include the testing of lake water for phosphorus, clarity, calcium and *E. coli* bacteria, and research and public education about water quality issues. KLSA has partnered with universities, colleges and governmental agencies to conduct research studies and produce publications. KLSA is led by an up to twelve member Board of Directors. A list of the members of the Board is provided in Appendix A.

Please Note:

To obtain copies of our report or to find out more about KLSA, please contact:

Kawartha Lake Stewards Association

264 Bass Lake Road, Trent Lakes ON K0M 1A0

Email: klsa@klsa.info

You can view Adobe pdf versions of KLSA reports on the new KLSA website: www.klsa.ca

Cover Photo Contest Winner: Sunset on Big Duck Pond, Stoney Lake

Photo credit: Irene D'Amours

Graphic Design by Danielle Shaw (Gull's Graphic Design)

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Mission Statement

The Kawartha Lake Stewards Association was founded to carry out a coordinated, consistent water quality testing program (including bacteria and phosphorus) in lake water in the Kawartha Lakes. KLSA ensures that water quality test results, prepared according to professionally validated protocols with summary analysis, are made available to interested parties. KLSA has expanded into research activities that help to better understand lake water quality and may expand its program into other related issues in the future.

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Editorial Committee:

Chair: Sheila Gordon-Dillane

Members: Carol Cole, Tom McAllister, Jacqui Milne, Kimberly Ong, Jessica Livingstone, and Heather Alley.

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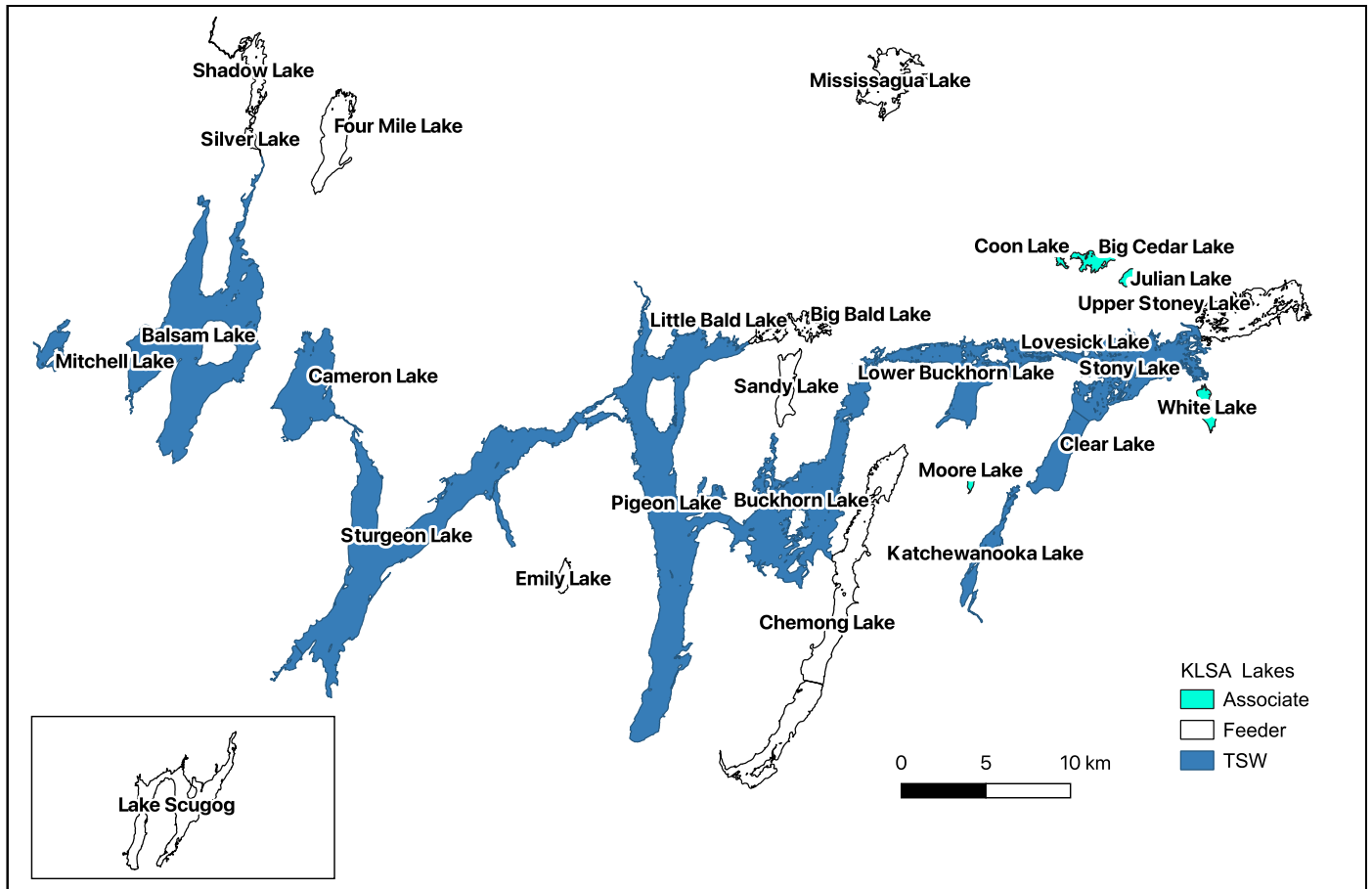
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KLSA Map & Land Acknowledgement



Land Acknowledgement

We acknowledge that the Greater Peterborough Area is in Michi Saagiig Nishinaabeg territory, in the context of the Rice Lake, Treaty 20 and Williams Treaties.

We wish to recognize First Nations rights in these Treaty areas.

In keeping with KLSA's mission, we wish to emphasize the past and current efforts of First Nations peoples as nibi-apisidoon (water protectors).

There is much we can learn from First Nations' knowledge of the land and what is needed for a more sustainable and regenerative future.

Chair's Message

Ed Leerdam, Chair

Kawartha Lake Stewards Association

Welcome to our silver anniversary edition of our annual Lake Water Quality Report!

25 years of lakes stewardship and water quality testing!

25 years of hundreds of volunteers collecting samples of water from their lakes for testing for *E. coli*! And more!!

25 years of donations from individuals, businesses and associations, and grants from municipalities, to support the Kawartha Lake Stewards Association and our work as lake stewards throughout the Kawarthas!

Many many thanks to all the volunteers, supporters and donors over our 25 years.

Many many thanks to all the Board Directors (who are also all volunteers), past and present for continuing the vision of our founders for 25 years.

A historical timeline

Late April – early May 2000: heavy rainfall in and around the town of Walkerton, a small town in Southwestern Ontario near Lake Huron, population just over 5,000. Bacteria from the manure of nearby cattle used to fertilize crops is drawn into the shallow aquifer of a nearby well, contaminating the drinking water supply of the town.

May 17, 2000: The first reported case of an *E. coli* infection in the town.

The contamination of the town's drinking water with *E. coli* caused gastroenteritis and sickened more than 2,000 people, resulted in seven deaths, and left others with chronic illnesses.

Subsequently, an inquiry into the outbreak, called the *Walkerton Inquiry*, took place. Improper water treatment following heavy rainfall was later found to be the cause. Two Walkerton Public Utilities Commission operators, neither of whom had any formal training, were charged, with one sentenced to jail time and the other to house arrest. As a result, stricter water treatment guidelines were put in place by the Provincial government.

Later in the summer of 2000: The Kawartha Lake Stewards Association started to form unofficially

with a few concerned residents and cottagers who initially took water samples from their respective lakes to a lab for testing. Our founders were: Jim Keyser - Lower Buckhorn Lake, Pat Moffat – Lovesick Lake, Kathleen Mackenzie - Stony Lake, and Jeff Chalmers – Clear Lake.

From the first Lake Water Quality Report (2001): **“We decided to form a volunteer-driven non-profit organization that represented local lake associations and property owners in the Kawartha Lakes area. The organization would co-ordinate testing for lake water quality in the area.”**

By Summer 2001: The Kawartha Lake Stewards Association had expanded, and with 26 volunteers were ready to carry out water quality testing at 115 sites on 11 lakes, from Pigeon Lake to Katchewanooka Lake. *Note that current Board member Sheila Gordon-Dillane, who has been a member or Chair of the Editorial Committee for 20 years (who produce our annual Lake Water Quality Reports), is one of the original volunteer samplers (Concession 17 Pigeon Lake Cottagers Association – Pigeon Lake).*

A Board of Directors was formed, with the founders as the Officers (Jim Keyser – Chair, Pat Moffat – Vice-Chair, Kathleen Mackenzie – Vice-Chair, Jeff Chalmers – Secretary / Treasurer). Two others joined the Board as Directors: Peter Fischer – Katchewanooka Lake, and Mark Potter – Lower Buckhorn Lake.

August 21, 2001: The Kawartha Lake Stewards Association founders formalized the Association as a non-profit Corporation by filing Letters Patent for Incorporation with the (then) Ministry of Consumer and Commercial Relations.

KLSA Mission Statement 2001: *“The Kawartha Lake Stewards Association objects are to carry out a coordinated, consistent, water quality testing program (including bacteria and phosphorus) of lake water on lakes within the Trent Canal System watershed. The Kawartha Lake Stewards Association will ensure water quality test results, prepared by an accredited laboratory with summary analysis, are made available to all interested parties. In future years the Kawartha Lake Stewards Association may expand its water quality program and may concern itself with other related matters.”*

February, 2002: KLSA's first annual Lake Water Quality Report *“Don't Feed the Geese!”* is published.

The current KLSA Board of Directors is proud and

Chair's Message ... cont'd.

dedicated to continue carrying out the vision and mission of our founders.

KLSA enjoys an excellent reputation as a community science organization and as stewards of our lakes and streams in the Kawarthas. Over the years since our beginnings in 2001, KLSA has collaborated with, counselled with, or otherwise connected with governments at all levels, academic institutions and professors at: Queen's University, Trent University, Ontario Tech University, Fleming College (including mentoring students in Environmental Sciences programs), conservation authorities, First Nations, and other environmental organizations. We are honoured to have been asked to join Boards and Advisory Committees, including Municipality of Trent Lakes' Environmental Advisory Committee, Kawartha Conservation's Community Implementation Advisory Group, Federation of Ontario Cottagers' Associations (FOCA) Environmental Advisory Group, and County of Peterborough's Watershed Plan.

Our work at KLSA remains constant with our water quality monitoring programs (*E. coli* (our foundational program), participation in the Lake Partner Program, water temperature and dissolved oxygen monitoring), our Natural Edge program, and our outreach and education programs including producing this annual Lake Water Quality Report.

When we can we take on additional projects. As an example ... for two years now we have supported and collaborated with Kawartha Conservation on their nearshore sampling program on 4-5 lakes in the Kawarthas (see articles in this and last year's Reports). We will be continuing this collaboration in 2026.

As part of our ongoing mission to support lake stewardship and scientific understanding, we were thrilled to announce our new **KLSA Graduate Scholarship** at our annual Fall meeting last September. This \$3,000 scholarship will be awarded annually to a qualified graduate student (Masters or PhD) whose research is primarily focused on lakes, streams, and wetlands in the Kawartha Lakes region.

We are always very thankful to those people who choose to volunteer their time and talents on our Board of Directors. Last year we bid farewell to Roland van Oostveen, who served on the Board from September 2023 to August 2025. During his short two years on the Board Roland was instrumental in the setup of our new website, and was our videographer / photographer at our public meetings. You may

still see Roland behind the cameras as he has promised to continue recording our public meetings if he is able to attend the meetings.

Joining our Board in 2025 were Jessica Livingstone, Heather Alley and Jeffrey Blodgett. All three new Board members bring a passion for our environment and healthy lakes, and come with an education in Environmental Studies and/or in practical application. These three new Board members represent a younger generation of volunteers on our Board, and we look forward to their engagement and participation in many KLSA activities and programs, and perhaps eventual leadership in the organization.

We are especially grateful to our other volunteers 'in the field', doing the water-sampling on our lakes, shrub plantings in our Natural Edge program, water temperature monitoring and dissolved oxygen sampling, and other programs we run or partner on from time to time. Without these volunteers we would have no data and no association. Please contact us at klsa@klsa.info if you would like to volunteer in any of these programs – they take little time and effort.

We could not do anything without our supporters – Lake/Cottage Associations, businesses, individuals, and local Municipal Governments who give us donations and grants, and our advertisers who support us by buying ad spots at the back of our report. Please support these local businesses whenever possible.

Thank you to everyone who submitted photos in our contest for the front cover of this report. We had many submissions this year! All the lovely photos show how much we all love this area. You will find the winning photo on our front cover, and all the submitted photos throughout this Report. Enjoy!

Please plan to attend our annual Spring Public Meeting, this year being held on Saturday May 23, from 9:30am – 12:30pm, at the Buckhorn Community Centre on Lakehurst Road. We are working on plans now but we will have the same format as last Spring, with interactive exhibits and displays from seven or eight organizations with tables set up in the hall. With so much participation we will have just one main speaker, North Pigeon Lake Association President and avid ornithologist, Warren Dunlop, thus allowing more time to interact with exhibitors and each other. Look for our announcements via email, on our website and Facebook page.

Chair's Message ... cont'd.

Final word there is a changing of the guard in KLSA's Executive. This is my last Chair's Message as I am stepping away from the roles of Chair (since 2020, with a one term interruption) and Treasurer (since 2018), and Fundraiser (since 2023), but remain on the Board as Past-Chair. Our Board is not changing for 2026. The new Executive was elected by the Board after our AGM in March 2026, and will be presented at our May 23 Public Meeting.

To contact us, please send an email to klsa@klsa.info or feel free to call us at 416-453-4472.

We congratulate our friends at Kawartha Land Trust and Scugog Lake Stewards who are also celebrating their Silver Anniversary!

Have a wonderful summer!

Ed Leerdam



Loon Visits Kayak. *Photo Credit: Sandra Morrison Silver Lake, Coboconk*
This was the first runner up in our 2026 cover photo contest!

Don't Feed the Geese! The KLSA Annual Lake Water Quality Report

Working Together for 25 Years to Share Knowledge to Protect the Kawartha Lakes

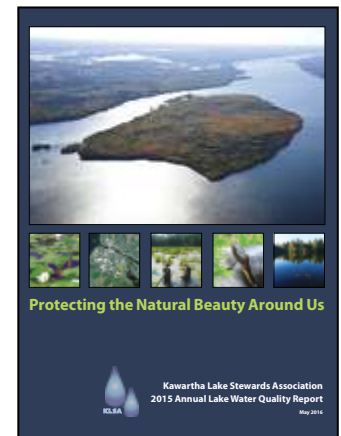
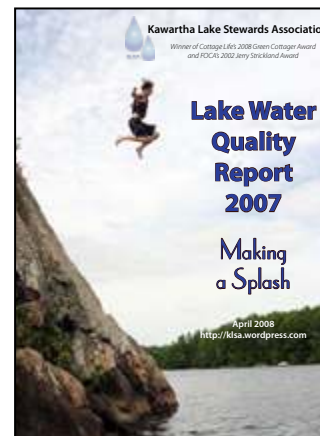
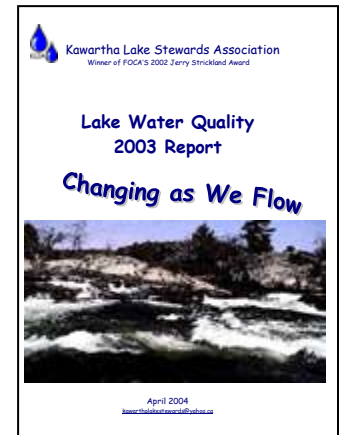
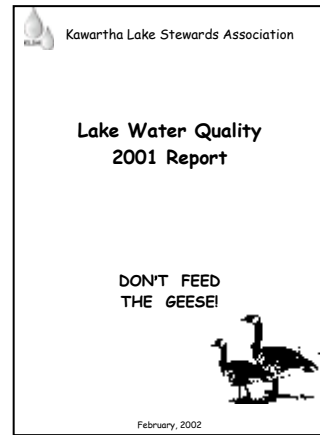
Sheila Gordon-Dillane, *KLSA Director and Chair, KLSA Editorial Committee*

In addition to KLSA celebrating its 25th anniversary, this is the 25th annual Lake Water Quality Report (LWQR) published by KLSA. Produced by Founding Members Pat Moffat, Kathleen Mackenzie and Jeff Chalmers, the first report in 2001 focused on the new *E. coli* testing program created by KLSA and its participation in the Federation of Ontario Cottagers' Associations (FOCA)/Ministry of the Environment's (MOE) Lake Partner Program (LPP).

Publication of the *E. coli* results provided the cottage associations that had collected samples and had paid for the tests by Lakefield Research (now SGS) with results to share with their members. In most cases the bacteria levels were low, which was reassuring but it also provided evidence that waterfowl such as ducks, Canada Geese and gulls were a source of *E. coli* and efforts should be made to keep them off the shoreline and discourage people from feeding them. "Don't Feed the Geese!" became the fitting title of the first edition of the LWQR.

The LPP deep water samples, collected by volunteers once a month from May to October and mailed to the MOE Laboratory in Dorset, were initially tested for phosphorus levels and water clarity measured using a Secchi disc. Calcium was added to the sample analysis in 2008 and Chloride (mainly from road salt) was added later. Phosphorus levels of 20 ug/L or higher were associated with toxic blue-green algae which could be a health risk to humans and pets. The results of this important testing are shared annually in the LWQR.

From the start, KLSA volunteers worked with scientists at Trent University, Fleming College and the MOE. In later years, collaborations expanded to include faculty and students at Ontario Tech University, Queen's University and the Kawartha and Otonabee Region Conservation Authorities. KLSA volunteer community scientists supported their research projects by collecting water samples, having data loggers on their docks, identifying plants and algae and more. These efforts were documented in articles in the Annual Reports and led to an expansion of KLSA's activities to topics such as the impact on water quality of aquatic plants (not to be called weeds),



Past covers of the Annual Lake Water Quality Report: 2001 (top left), 2003 (top right), 2007 (bottom left) and 2015 (bottom right).

algae and invasive species such as zebra mussels, water soldier, mystery snails and starry stonewort. The data compiled over the past twenty-five or more years is a valuable database for faculty, students and policy makers at all levels of government in the region.

Topics that have been addressed frequently or in a series from year to year have included:

- Results of *E. coli* and the Lake Partner Program testing
- Lake Management Plans in Cameron, Balsam, Sturgeon and Pigeon Lakes
- Annual performance of wastewater treatment plants throughout the Kawartha Lakes region
- Signs of climate change affecting water quality, birds, plants and animals

Don't Feed the Geese! ... cont'd.



The 2011 KLSA Editorial Committee



The 2014 KLSA Editorial Committee

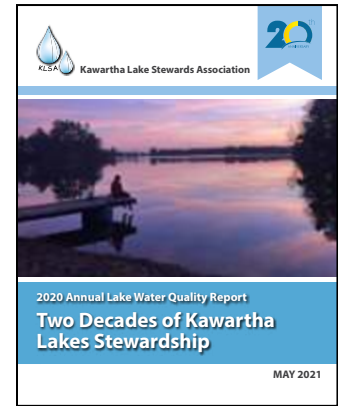
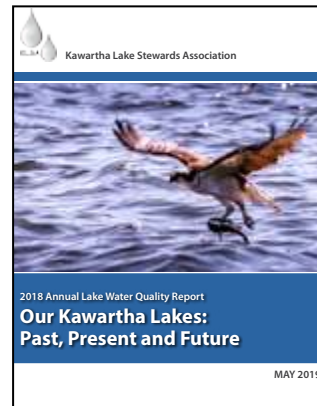
- Ways to keep shorelines natural, avoid the use of fertilizers and prevent runoff from lakefront lawns
- Aquatic plants and algae – identifying them and their prevention or management, distinguishing between invasive and native species
- Studies such as Kawartha Conservation's water temperature and dissolved oxygen project and the paleolimnological study of core sediment samples dating back 200 years
- The geology, geography and history of the lakes on the Trent-Severn Waterway
- Monitoring opportunities such as the Canadian Lakes Loon Survey and the Clam Counter
- Conveying public health messages such as the importance of septic system maintenance and the Clean, Drain and Dry legislation
- Reports on KLSA stewardship programs such as Natural Edge and Love Your Lake
- Descriptions of the programs of environmental organizations such as the Kawartha Land Trust, Watersheds Canada and FOCA.

The Annual Report also provides a place to thank the generous donors who support KLSA and the

many volunteers who participate in our programs. Each issue includes a Chair's Message and the financial statements of KLSA. Beginning with the 2020 edition, three pages of advertisements were added to promote local businesses and cover printing costs. The following year, a contest for a photograph for the front cover was held, eliciting an enthusiastic response. This has now become an annual feature of the Report.

We are grateful to Jeff Chalmers, Simon Conolly, Joyce Volpe, Jessie Gordon and, since 2018, Danielle Shaw (Gull's Graphic Design) for graphic design and Terry McQuitty of the *Lakefield Herald* for arranging the printing and delivery of the publication. A change in format in 2013 allowed us to increase our print run to 2000 copies. Distribution to cottage associations and others takes place at our spring public meeting and copies are available at municipal offices, local businesses, retail outlets and tourist offices. All of the past issues are on the KLSA website.

Thank you to the authors of the many articles and to our hard-working Editorial Committees over the past 25 years. We hope you will enjoy our Lake Water Quality Report for many years to come.



Past covers of the Annual Lake Water Quality Report: 2018 (*top left*), 2020 (*top right*), 2021 (*bottom left*).

From Classroom to Shoreline: Supporting Student Research on the Kawartha Lakes

Carol Cole, KLSA Communications Lead

In 2025, the Kawartha Lake Stewards Association (KLSA) strengthened its commitment to student research by announcing a new annual KLSA Graduate Scholarship. Beginning in spring 2026, this \$3,000 scholarship will be awarded to a graduate student whose research focuses on lakes, streams, and wetlands in the Kawartha Lakes region. For students, the scholarship not only offers welcome financial support, but just as importantly, it recognizes the value of research that connects academic work with real-world lake stewardship. By supporting students at a key stage in their academic and professional development, KLSA hopes to help inspire the next generation of researchers whose work will deepen our understanding of lake health in the Kawartha Lakes.

While the graduate scholarship is new, KLSA's support for students is not. KLSA has a long history of working alongside students by supporting their research, and providing mentorship focused on the Kawartha Lakes. For nearly two decades, KLSA has built strong partnerships that benefit students, the lake community, and the overall health of the watershed.

This commitment was clearly expressed in 2009 when KLSA Chair Mike Stedman wrote in the annual *Lake Water Quality Report (LWQR)*, "There is something very rewarding when students in your own community contribute significantly to a better understanding of our Kawartha Lakes environmental issues". In practice, KLSA's involvement with students began even earlier, in 2005, with two early studies focused on phosphorus sources within the lakes.

The first study was coordinated by KLSA Board member Kevin Walters and carried out by Michael White, then a PhD student at Trent University. His research documented phosphorus concentrations in the lakes and examined historical data, lake characteristics, and land use patterns to better understand what contributes to phosphorus loading. The goal was to identify practical actions that could help prevent and reduce phosphorus inputs to the Kawartha Lakes. The second project was a Credit for Product (C4P) study completed by students at Fleming College under the guidance of faculty member Sara Kelly. These students examined the impact of six local sewage treatment plants, comparing allowable discharge levels with actual discharge



Trent students researching for KLSA's Aquatic Plants Guide, 2008

data, and presented their findings directly to KLSA - marking the beginning of a long and productive partnership.

That 2005 C4P project was the first of many. KLSA continued to mentor Fleming College students in the C4P program until 2022, shortly before the program ended. Over the years, students contributed valuable information on lake health while gaining hands-on field experience and practical research skills. Their projects covered topics such as phosphorus discharge from sewage treatment plants, shoreline biodiversity, lake flow mapping, swimmer's itch, and updates to the KLSA Aquatic Plants Guide. Throughout this time, KLSA Directors supported student teams by helping shape project goals and by providing direction and feedback. Each spring, students shared their results with the Kawartha Lakes community through presentations at KLSA public meetings.

Sharing student research has proven to be a win for everyone involved. Students have published articles in the KLSA annual LWQR and presented their work at public meetings. In the 2018 LWQR, Dr. Eric Sager of Fleming College and Trent University highlighted the value of this collaboration, noting that students gained a great deal from KLSA's mentorship while providing important data on lake health. For many students, presenting at a KLSA meeting or writing for the annual report became a defining moment in their studies, helping them see that their work truly mattered beyond the classroom.

Student collaboration continued to grow in 2023, when Dr. Robert Bailey, Professor of Applied

From Classroom to Shoreline ... cont'd.

Bioscience at Ontario Tech University and Vice-Chair of KLSA, worked with four final-year undergraduate students on their honours thesis projects. These projects drew on data collected by KLSA volunteers and partners over the past 20 years. Summaries of the students' work were published in the 2023 LWQR and shared with the community at KLSA's spring public meeting in 2024.

KLSA is always looking for new ways to support students while continuing to advance its goals of encouraging research and improving lake health. In 2024, KLSA launched a paid internship through the Love Your Lake initiative on Clear Lake in partnership with Watersheds Canada and the Canadian Wildlife Federation. Two interns completed 256 shoreline assessments and prepared personalized reports for property owners, offering practical recommendations to improve shoreline health. Their work helped empower landowners to take positive steps for the health of their lake.

Together, these efforts, from early student research projects to internships and graduate-level support, reflect KLSA's ongoing commitment to mentorship, collaboration, and healthy lakes.



Fleming College students developing a KLSA water testing instructional video



Photo contest entry: Dog at sunset. *Photo by: Lucas Braband.*

Lake Water Temperature and Oxygen Monitoring: 2025 Summary

Brett Tregunno, KLSA Director

2025 was our sixth straight year of tracking water temperature and oxygen conditions on the Kawartha Lakes – two of the most fundamental water quality attributes of our lakes.

Within the context of a warming climate, tracking water temperature and oxygen is extremely important. Warming air means warming waters, which has consequences for animal populations, algae and aquatic plant growth, and water quality. In general terms, the warmer our lakes become, the less oxygen they have available for aquatic life such as fish.

2025 surface water temperatures are shown in Figure 1. 2025 was the warmest summer since we began tracking in 2020. Compared to the same time the year prior¹ (summer 2024), there were on average 15 more days having water temperature above 25°C, which is a 42% increase. As usual, nearshore water temperatures (e.g., water at people's docks) were consistently warmer and more variable compared to offshore water temperatures (e.g., water where people boat), which were cooler and more stable. Maximum water temperatures at each site (29 sites) ranged from 26.6 to 32.7°C, with an average of 29.1°C which was 0.3 degrees warmer than 2024. The most recent data brings our total number of sampling events (i.e., total number of sites across 2020 to 2025) to 113, which contributes to our water temperature almanac for the Kawartha Lakes.

2025 lake oxygen profiles (15) are shown in Figure 2. The lakes in summer 2025 experienced similar oxygen conditions as in previous years. At a depth of approximately 6 to 8 metres below the surface, oxygen concentrations rapidly decline because of a phenomenon called 'lake stratification' to values² that usually have negative consequences for aquatic life. The period of low oxygen conditions typically ends when the water mixes. KLSA data indicates this can happen in certain lakes when they receive a big flush of water, which occurred during the summer of 2024. A significant drop in surface water temperatures can also trigger mixing in certain lakes, which is what we hypothesize happened in 2025 because of unseasonably cool air temperatures near the end of August.

KLSA would like to again extend our extreme gratitude for the help of 30 volunteers and the partnership with Kawartha Conservation that make this project possible.



Volunteer helping to record dissolved oxygen data every 1 metre in the deepest part of the lake.

¹ Refer to previous KLSA Annual Water Quality Reports beginning in 2020, as well as Table 1, for annual water temperature data summaries.

² For most of our lakes, a dissolved oxygen concentration threshold of less than 4 to 7 milligrams per litre is considered not meeting provincial water quality guidelines. For deep lakes such as Upper Stoney and Big Cedar a threshold of 5 to 8 milligrams per litre is more applicable.

Lake Water Temperature and Oxygen ... cont'd.

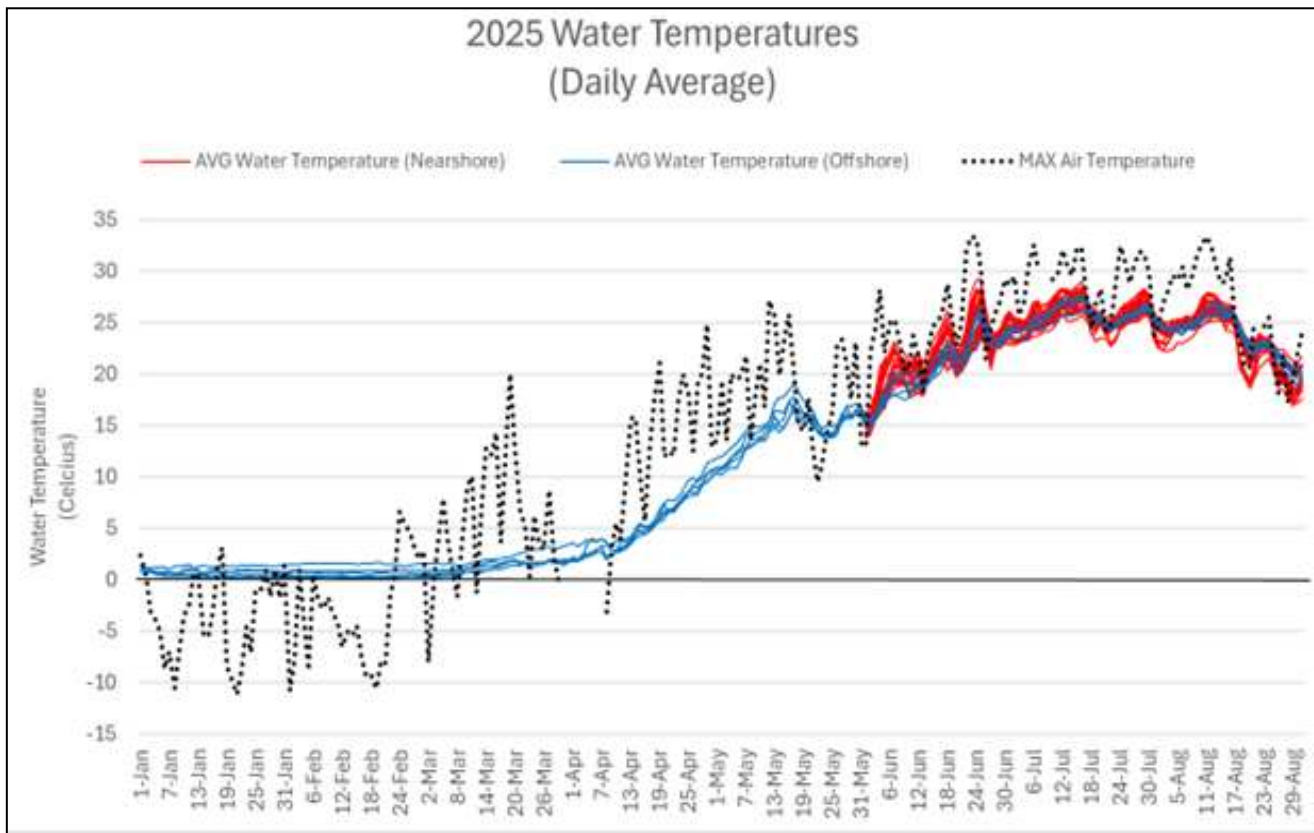


Figure 1. 2025 summer daily average water temperatures, plotted with daily maximum air temperatures (taken at Peterborough Airport).

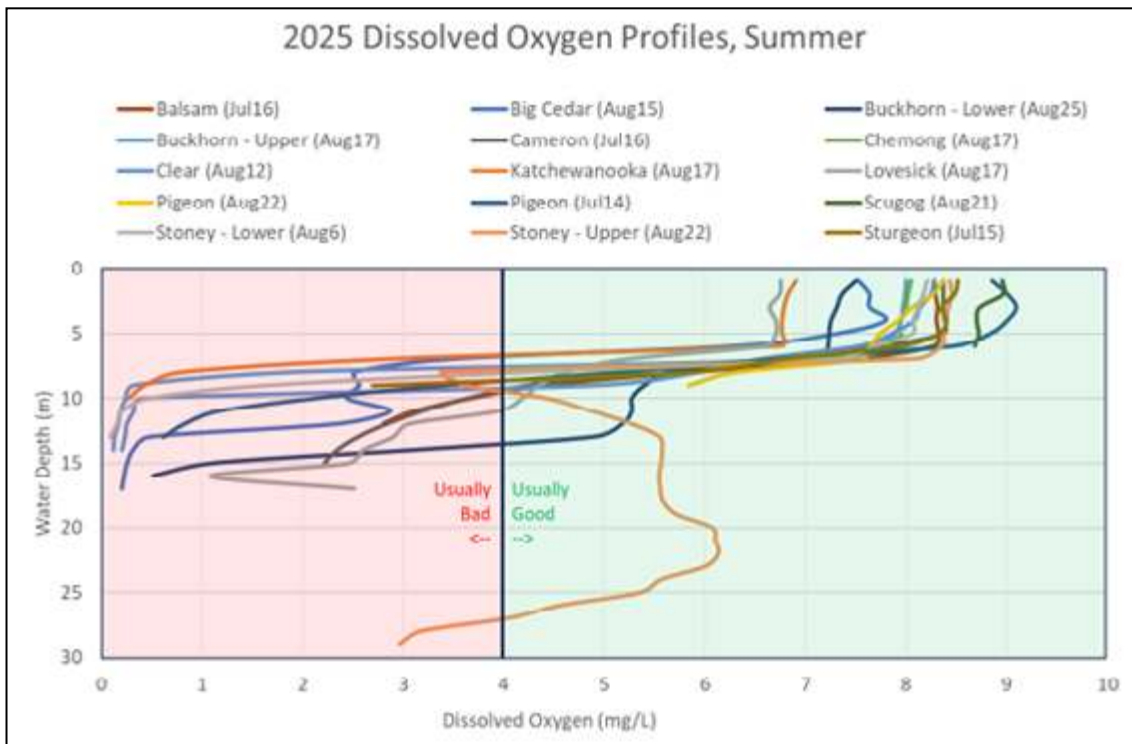


Figure 2. 2025 summer dissolved oxygen profiles (concentration at each metre below surface).

Lake Water Temperature and Oxygen ... cont'd.

Table 1. Annual water temperature data summaries

Site ID	Location	Waterbody Name	Days Above 25C (#)	Maximum Temp. (C)	Average Temp. (C)	Notes
2025 Bal1	Nearshore	Balsam Lake				No data - logger malfunction
2025 Bal2	Nearshore	Balsam Lake	55	30.0	24.2	Missing data before June 14
2025 Bal3	Nearshore	Balsam Lake	45	27.6	22.6	
2025 Bal4	Nearshore	Balsam Lake	50	29.1	23.3	
2025 TSW1	Offshore	Balsam Lake	45	28.5	23.2	
2025 LBU1	Nearshore	Buckhorn Lake (L)	58	29.9	24.3	Missing data after August 20
2025 Buc1	Nearshore	Buckhorn Lake (U)	55	29.8	23.9	
2025 TSW4	Offshore	Buckhorn Lake (U)	45	28.0	23.8	
2025 Cam1	Nearshore	Cameron Lake	56	28.3	23.4	
2025 Cam2	Nearshore	Cameron Lake	51	29.4	23.2	
2025 Cam3	Nearshore	Cameron Lake	48	28.8	23.1	
2025 Cam4	Nearshore	Cameron Lake	47	28.9	23.0	
2025 Cle1	Nearshore	Clear Lake	48	28.8	25.0	Missing data before July 1
2025 Cry1	Nearshore	Crystal Lake	43	27.7	23.2	
2025 Cry2	Nearshore	Crystal Lake				No data - logger missing
2025 Kat1	Nearshore	Katchewanooka Lake	43	27.3	23.0	
2025 TSW5	Offshore	Katchewanooka Lake	37	26.6	23.0	
2025 Oto1	Nearshore	Otonabee River	53	28.7	23.6	
2025 Pig1	Nearshore	Pigeon Lake	44	27.9	23.6	Missing data after August 18
2025 Pig2	Nearshore	Pigeon Lake	54	29.6	23.6	
2025 Pig3	Nearshore	Pigeon Lake	46	29.9	23.0	
2025 Pig4	Nearshore	Pigeon Lake	65	32.7	24.5	
2025 Pig5	Nearshore	Pigeon Lake	60	30.7	24.0	
2025 TSW3	Offshore	Pigeon Lake	42	27.9	23.3	
2025 San1	Creek	Sandy Creek	61	31.9	23.5	Creek site, not on a lake
2025 Scu1	Nearshore	Scugog Lake	56	29.7	23.6	
2025 Scu2	Nearshore	Scugog Lake	56	29.9	23.7	
2025 Scu3	Nearshore	Scugog Lake	59	30.5	23.7	
2025 Stu1	Nearshore	Sturgeon Lake				No data - logger missing
2025 Stu2	Nearshore	Sturgeon Lake	57	30.3	23.8	
2025 Stu3	Nearshore	Sturgeon Lake	57	31.7	23.8	
2025 Stu4	Nearshore	Sturgeon Lake	58	30.2	24.2	
2025 Stu5	Nearshore	Sturgeon Lake	46	27.8	23.1	
2025 TSW2	Offshore	Sturgeon Lake	43	28.1	23.3	
*AVERAGE all			50.8	29.1	23.5	
*AVERAGE nearshore only			52.6	29.4	23.6	
*AVERAGE offshore only			42.4	27.8	23.3	

*AVERAGE does not include data shaded in grey.

The Natural Edge Program: Five Years of Community Effort to Naturalize Shorelines

Kimberly Ong, KLSA Director

As the Kawartha Lake Stewards Association (KLSA) celebrates its 25th anniversary, the Natural Edge Program has become one of the organization's most community-driven initiatives. Since launching in 2021 in partnership with Watersheds Canada, the program has helped waterfront property owners restore their shorelines to a more natural and resilient state, benefiting both lake ecosystems and the people who enjoy them.

In just a few short years, the program has achieved remarkable results. With the help of dedicated volunteers and generous funding support, the Natural Edge Program has restored 41 shoreline sites across the Kawartha Lakes, planting over 3,000 native shrubs, trees, and wildflowers along 1,350 metres of shoreline, covering more than 5,300 square metres of waterfront habitat.

These plantings transform disturbed or manicured shorelines into thriving natural buffers. Shorelines are often called the "ribbon of life" because they form the critical transition between land and water. When restored with native vegetation, they help stabilize soil and prevent erosion, filter runoff before it enters the lake, and provide habitat for fish, birds, pollinators, and other wildlife. Natural shorelines can also deter nuisance geese and reduce the need for mowing and maintenance, creating a shoreline that is both ecologically healthy and beautiful.

Each project begins with a site visit and shoreline assessment by a plant expert. Using a specialized planning tool, a customized restoration planting plan is created that maps out the most suitable native plants for the shoreline's conditions. KLSA then coordinates the ordering and delivery of plants and materials, including soil, mulch, planting mats, and tree guards, and brings volunteers to help plant



Before and after: Native plants transform manicured shorelines into beautiful and resilient natural buffers. *Pictures courtesy of Michelle Lemme*

and bring the plan to life.

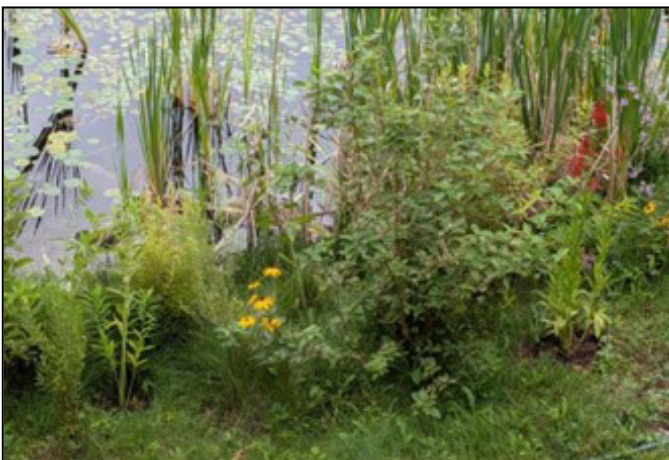
What truly makes the Natural Edge Program special is the community behind it. Since the program began, more than 100 volunteers from local communities, universities, and lake associations have contributed their time and energy to help restore shorelines

5 YEARS of Natural Edge	41 SITES Projects completed	1,350 m Shoreline restored
5,374 m² Habitat planted	3,000+ PLANTS Native trees, shrubs, and wildflowers	100+ VOLUNTEERS Community support

The Natural Edge Program ... cont'd.

across the region.

These planting days are not only productive, but also a great way to connect with neighbours and fellow lake stewards who care deeply about protecting our waterways.



Before and after: Shoreline restoration helps prevent erosion and restore habitat along the lake. *Pictures courtesy of Pam Dickey*



Volunteers from the local community come together to plant native species along a restored shoreline. More than 100 volunteers have contributed to Natural Edge plantings since the program began.

The program would not be possible without the continued partnership and technical expertise of Watersheds Canada, whose team provides shoreline assessments, restoration planning, and ongoing support. Funding and support over the years have been provided by Environment and Climate Change Canada through the EcoAction Program, the RBC Foundation's RBC Tech for Nature Fund, the Daniel and Susan Gottlieb Foundation, the Environment Council for Clear, Ston(e)y and White Lakes, and the Stony Lake Heritage Foundation. We also thank the Canadian Wildlife Federation, the Lovesick Lake Association, and the Kawartha Land Trust for their support of shoreline stewardship initiatives in our region. Their contributions, combined with the dedication of our volunteers and participating landowners, have helped make the Natural Edge Program a growing success across the Kawartha Lakes.

As interest in shoreline restoration grows, KLSA is excited to continue expanding the Natural Edge Program in the years ahead. If you are a waterfront property owner in the Kawartha Lakes region and

The Natural Edge Program ... cont'd.

would like to restore your shoreline, we would love to hear from you. The program includes a professional site assessment, customized planting plan, and access to native plants and materials to help transform your shoreline into a healthy, natural buffer.

Volunteers are also always welcome! Planting events typically take just a few hours and are a rewarding way to make a direct, positive impact on the lakes we all enjoy.

If you are interested in being involved, please email kim.ong@klsa.info.

Together, with the support of landowners, volunteers, partners, and funders, we can continue restoring and protecting our shorelines for the next 25 years and beyond.



KLSA volunteers, partners, and landowners celebrate another successful Natural Edge planting day. Community participation is at the heart of the program's success.



Photo contest entry: Heading to open water, Stoney Lake. *Photo by: Irene D'Amours.*

Shoreline Supports: Tips for a Healthy Shoreline and Naturalization Grants Available

Julia Derue, Stewardship Technician,
Kawartha Conservation

The Kawartha watershed is more than just a beautiful place to live - it's where your water comes from, where you hike, paddle, and explore, and where your actions shape the health of the environment.

You may or may not realize that where the land and water meet is one of the most complex natural environments we can encounter. Your waterfront is acting as the lake's lungs and a nursery while supporting biodiversity, filtering pollutants, and stabilizing shorelines - all in the thin band where land and water meet.

Landowners stand at the forefront of positive environmental stewardship, having the ability to enhance and re-naturalize their properties to support the collective overall health of the community's shared water resources now and for generations to come.

How can we support maintaining a healthy shoreline? Here are 5 tips that you can do to support our local waterways from your backyard.

1. Establish a "No-Mow Zone"

No-Mow zones are designated areas that are left unmowed or are only mowed a few times per year. These zones create a "buffer" that allows for increased water collection and infiltration, and reduces sediment and nutrients in water runoff. Not only this, but it is also a great place to create habitat for birds, butterflies, and native plants.

To create a no-mow zone, simply stop mowing your lawn along your shoreline. For best results, we recommend you refrain from mowing at least 3 m (10 ft) back from your shoreline for 75% of the length of your shoreline.

Creating a no-mow zone is low cost and low maintenance; however, it's recommended to remove weeds and invasive species and plant native shrubs and perennial flowers. When the native vegetation flourishes and the no-mow zone matures, there will be fewer unwanted plants.

2. Re-naturalize Your Shoreline

If you're looking to take it a step further, re-naturalize your shoreline by allowing for the native vegetation to grow back in. This will provide the most stability against shoreline erosion, improves water quality by



Northern Blue Flag Iris (*Iris versicolor*). A water-loving, native shoreline perennial.

sequestering excess nutrients and pollutants, and creates habitats for aquatic animals, pollinators, and other local wildlife. To enhance this, consider planting native species you find aesthetically pleasing to support your local landscapes while maintaining the greenspace you value.

3. Keep it Gradual

A gradual shoreline is a healthy shoreline. The soft slope from upland landscapes to the water's edge is vital to ensure native vegetation can re-root up or down as water levels naturally rise and fall. This area where the land slopes into the water, called the littoral zone, is often referred to as the "ribbon of life." It is estimated that 90% of freshwater species either live in or pass through this shallow, sunlit, nearshore as part of their lifecycle.

Rather than installing a vertical break wall or impervious walkway, consider keeping the natural slope of your waterfront by installing a "riprap" of sloped rock to dissipate the wave action's energy, and by encouraging deep-rooted vegetation to keep a foothold by the water's edge.

4. Reduce Runoff

Rainwater management strategies are an effective and simple way to reduce the amount of runoff making its way into bodies of water. Runoff is stormwater that accumulates on hardened surfaces and flows overland. When stormwater washes across hard surfaces and lawns, it can pick up pollutants

such as fertilizers, pesticides, bacteria from pet waste, and sediments. By diverting the flow of water into rain barrels, rain gardens, or other features, you are stopping the excess flow of stormwater from making its way across the landscape directly into waterways.

5. Plant Native

Finally, one of the best things to support our local waterways is to plant native species. As previously mentioned, they have a whole host of benefits including deeper roots for more stable shorelines, a higher rate of infiltration than non-native plants and lawns, encouraging native biodiversity and pollination, reducing erosion, and more. Native plants are perfectly adapted to our local region and conditions and can better withstand fluctuations in weather patterns as the climate continues to change. Not to mention, there are so many options to choose from that you can create a thriving, vibrant place to enjoy on the water's edge!

Kawartha Conservation's Water Fund:

If any of the tips listed above have you feeling inspired and you're looking to undertake a project that improves the health of our lakes and rivers, consider applying for Kawartha Conservation's Water Fund.

The Water Fund is a cost-sharing, reimbursement program for landowners and not-for-profit community organizations in the Kawartha Watershed that supports projects that will lead to a positive impact on water quality and ecosystem health. This includes parts of the City of Kawartha Lakes, Durham Region, and the Township of Scugog. Eligible projects include native tree and shrub planting, shoreline erosion control and naturalization, rainwater management and diversion features, septic system upgrades, well decommissioning, and more. Landowners and community groups can receive a reimbursement for up to 50% of approved project costs, to a maximum of \$4,000!

The Kawartha watershed is a valuable place to explore, play, and live in. By creating many localized projects in our region, we are collectively re-naturalizing and enhancing the water quality of our shared resources. Not only are our individual actions supporting the health of our environment, but they can dramatically change your personal property for the better.

If you have a project in mind or are looking for more tips to enhance your shoreline, please contact our Stewardship Technician, Julia Derue at jderue@kawarthaconservation.com or 705-328-2271 ext. 241.



Photo contest entry: Sunset Mirror Image, Stony Lake. *Photo by: Janie Kelly.*

KLSA *E. coli* Results for 2025

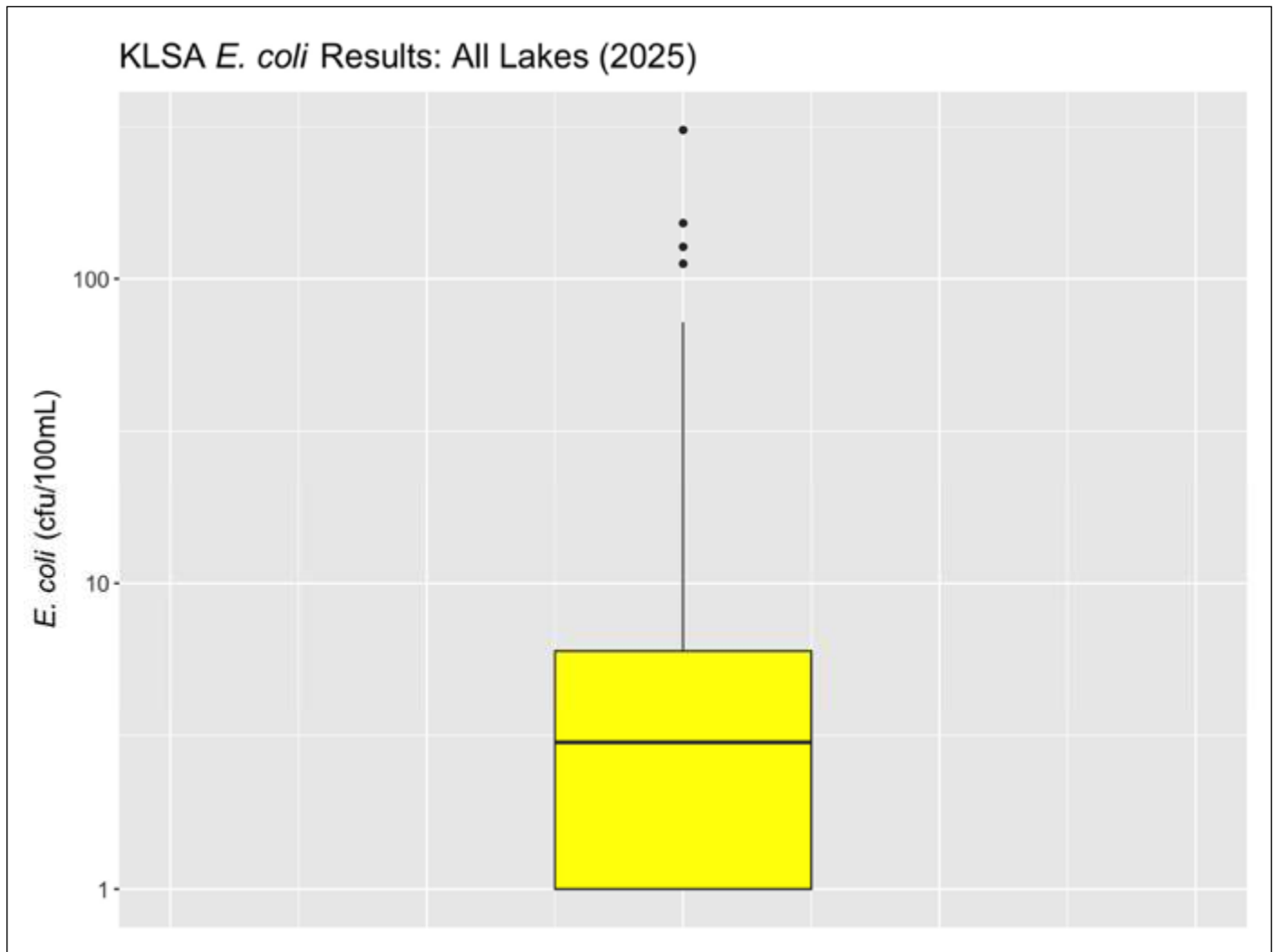
Bob Bailey, KLSA Director, Professor of Science, Ontario Tech University

Results of *E. coli* analyses are expressed as *E. coli* cfu/100 mL because when a water sample is grown on nutrient medium in a warm laboratory incubator, each live bacterium will multiply to form a visible colony which is counted 18-24 hours later. Public beaches in Ontario are 'posted' when the level of *E. coli* in the water exceeds 200 cfu/100mL. This means that the water is considered unsafe for recreational use.

KLSA considers counts over 75 cfu/100mL as somewhat high for the Kawartha Lakes, while counts of 20 and below, with an occasional reading between 20 and 50, are typical. The presence of *E. coli* usually indicates fecal contamination from warm-blooded animals such as birds or mammals, including

humans. Although *E. coli* can be dangerous, most strains are harmless. The usual water sample analysis does not distinguish the difference between harmless and pathogenic strains.

In 2025, KLSA's *E. coli* water sampling program was carried out by volunteers at 56 sites in 14 lakes up to five times each through the summer. As shown in the boxplot below, more than 75% of all *E. coli* samples had concentrations less than 10 cfu/100mL and almost 30% of the samples had no detectable *E. coli*. Note that a log scale is used on the boxplots since it shows percentage variability among observations rather than absolute differences. For example, the difference between one sample having 10 cfu/100mL versus another having 20 cfu/100mL is more important than the difference between two samples having 100 cfu/100mL and 110 cfu/100mL.



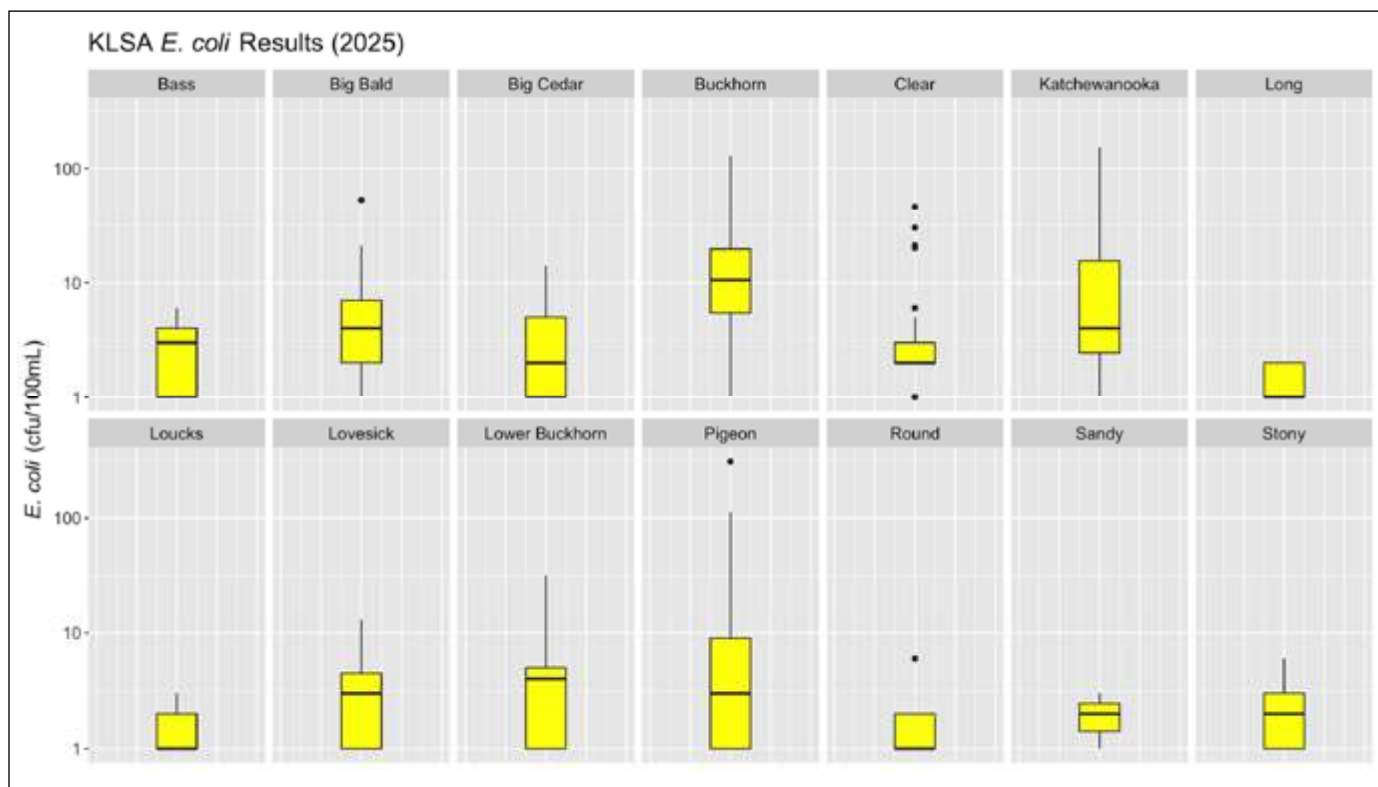
KLSA *E. coli* Results for 2025 ... cont'd.

It is challenging to compare *E. coli* among lakes because different factors determine where samples are taken in each lake, and as the table below shows, some lakes get more than others. Of the lakes sampled more than 10 times, Lovesick had the lowest proportion of *E. coli* positive samples (67%) while Katchewanooka had the highest (93%).

Big Cedar had the lowest median concentration, although Clear would have been lower if it had not had a few high concentration outliers (see the boxplots below and on page 20). Buckhorn had the highest median concentration (10 cfu/100mL) but substantial variability among its 12 samples (minimum = 0, maximum = 127 cfu/10mL).

Those interested in looking at the raw data from 2025 and past years can download spreadsheets from the KLSA website. Please contact klsa@klsa.info if you are interested in taking samples for *E. coli* analysis in your favourite Kawartha lake(s)!

Lake	# of Samples	% <i>E. coli</i> Positive
Bass	5	60
Big Bald	25	80
Big Cedar	35	71
Buckhorn	12	83
Clear	45	76
Katchewanooka	15	93
Long	5	40
Loucks	5	40
Lovesick	15	67
Lower Buckhorn	29	66
Pigeon	69	71
Round	5	40
Sandy	3	67
Stony	5	60
TOTAL	273	71



Climate Drivers of Among- and Within-Year Variation in *E. coli* Concentration in the Kawartha Lakes

Bob Bailey, Omar Afzalzada, and Leila Martinez, Ontario Tech University

Introduction

In Canadian freshwater ecosystems used for recreation, the concentration of *Escherichia coli* (*E. coli*) is a commonly used indicator of recent fecal pollution from mammals (including humans) and birds (Jang et al. 2017, Sanchez et al. 2021). To minimize risk to recreational users, Canadian guidelines recommend an *E. coli* concentration of less than 234 colony-forming units per 100mL (cfu/100mL) averaged from five samples, or less than 200 cfu/100mL from multiple sampling visits (McKergow and Davies-Colley 2009, Franczy et al. 2013, Sanchez et al. 2021).

Like any biological population, the concentration of *E. coli* in fresh water at a specific time and place is a matter of source, delivery, survival, and population growth. In recreational lakes in Canada, the major source of *E. coli* is waterfowl, although less commonly humans and other mammals may add significant contamination due to faulty septic systems or poor management of pet waste. Delivery of *E. coli* to particular sites in freshwater lakes might be direct (e.g., waterfowl at a site) or indirect (e.g., stream inflow). Once present at a site, *E. coli* doesn't multiply significantly in the low temperature and low nutrient environment, so its concentration is mostly determined by its survival (Blaustein et al. 2013).

Weather conditions, particularly rainfall and temperature, are important in determining *E. coli* concentrations through effects on both delivery from source areas and survival in the aquatic environment (Tornevi et al. 2014, Jang et al. 2017, Hong et al. 2021, Sanchez et al. 2021, Desta et al. 2024). Rainfall events facilitate the transport of *E. coli* from terrestrial sources to water bodies through surface runoff and stormwater drainage (McKergow and Davies-Colley 2009, Hong et al. 2021). Temperature affects *E. coli* survival and persistence in environmental waters, with warmer conditions generally supporting longer survival times (Jang et al. 2017, Sanchez et al. 2021, Desta et al. 2024).

Although *E. coli* is monitored at public beaches around the world, private landowners, including commercial resorts, are usually responsible for their own monitoring. Community science can play an important role in such monitoring by facilitating water sampling by community members and allow-

ing professional analysis of the samples at a reasonable cost. Since 2001, the Kawartha Lake Stewards Association (KLSA) has managed an *E. coli* sampling program in the Kawartha Lakes. In these 25 years, more than 11,000 water samples for *E. coli* analysis have been collected by volunteers at over 900 sites in 18 lakes across the Kawarthas. The sampling program is based on voluntary participation by individuals or lake associations that choose the sampling sites and then pay KLSA for the analysis. To maintain confidentiality, other than the lake name, no attributes of the sampling site, including its location, are published or recorded in the dataset. The results have been presented in KLSA's Annual Lake Water Quality Reports, first published after the 2001 sampling year (KLSA 2002).

Because there is a time delay in collection of water samples for *E. coli* analysis, it would be valuable to predict when the risk of elevated *E. coli* in recreational waters is higher. In our study, we modeled the effect of weather (temperature and rainfall) prior to sampling and over the course of summer sampling to understand the effects of weather on the occurrence and abundance of *E. coli* in the Kawartha Lakes.

Methods

Our conceptual model for *E. coli* included both modeled (e.g., year of sampling, weather prior to sampling) and error (e.g., analytical measurement error, site characteristics) causes of variation (Figure 1). Water samples were collected and submitted for analysis by community scientist volunteers, with sampling bottles and protocol provided by KLSA managers of the program in consultation with the SGS laboratory in Lakefield, Ontario. The *E. coli* concentration in each sample was determined at SGS using the protocol described in Stott (2023), and the data were initially cleaned using Excel, with further restructuring and data-checking in R (R Core Team 2021) in preparation for analysis. Daily maximum air temperature (°C) and total precipitation (mm) recorded at nearby Peterborough Airport and Trent University weather stations between June 20th and September 20th from 2001 to 2025 were downloaded from Environment and Climate Change Canada. For each summer day in this dataset, we used Excel to calculate the mean maximum daily temperature and total precipitation over the previous seven days, and the seven days prior to that. This resulting weather dataset was then merged with the *E. coli* dataset by sampling day so that the year of sampling and

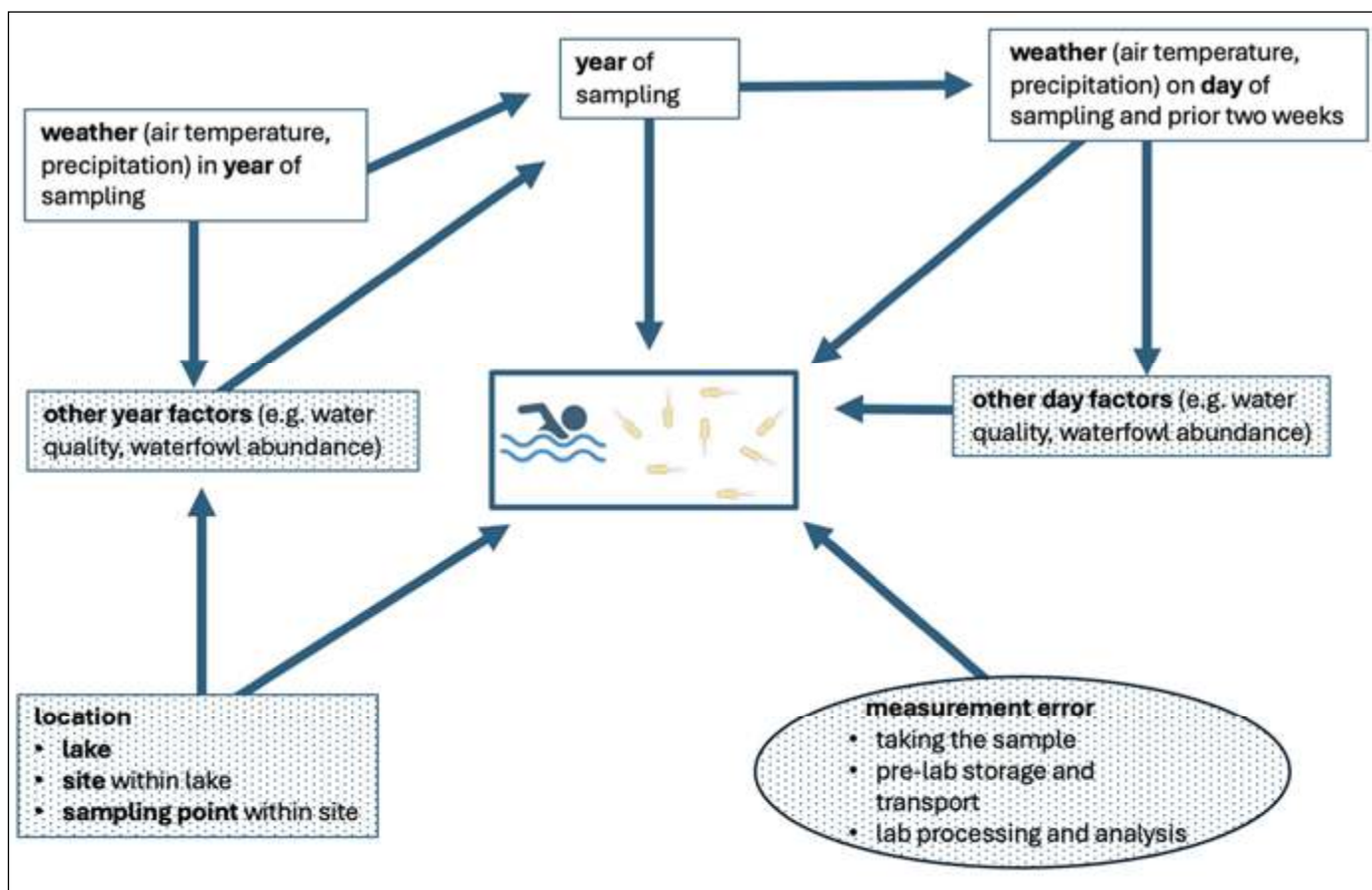


Figure 1 – Conceptual model of variation among individual samples in *E. coli* concentration. Factors in stippled boxes were unexplained (error) variation in models.

weather in the two weeks prior to the sampling day could be used to predict *E. coli* occurrence and abundance among the more than 11,000 water samples.

Initial inspection showed that almost 30% of the samples had no detectable *E. coli*, so we modeled the presence or absence of *E. coli* (Figure 3a) as well as the chance of *E. coli* counts greater than 10 cfu/100mL (80th percentile of full distribution; Figure 3b). In all 25 years, there was a very small chance of an *E. coli* sample greater than 100 cfu/100mL (98th percentile of full distribution; Figure 3c). All of our models used year of sampling, sampling weather (maximum temperature and total rainfall) in the two weeks prior to sampling, and the interaction of year and weather as candidate predictors. We fit a sequence of increasingly complicated models and picked the model with the smallest number of good predictors of *E. coli*.

Summer weather in the Kawartha Lakes for each

year from 2001 to 2025 was summarized by extracting summary statistics of temperature and rainfall by year from the daily weather dataset. The major gradients of air temperature and rainfall over the 25 years were determined, and correlations between weather over the summer and *E. coli* were determined.

Results

Over the 25 years of *E. coli* sampling, the summer rain and maximum temperature varied widely. Total rainfall over seven days ranged from 0mm to just over 250mm, with a median of about 11mm per week. Average maximum temperature over a week varied from less than 20°C to over 33°C, with a median of about 26°C.

There was a strong effect of the year of sampling and a more modest effect of sampling weather on the chance of a positive *E. coli* sample (> 0 cfu/100mL). Over the 25 years of sampling, the chance of *E. coli* positive samples ranged from less than 60% in 2017

Climate Drivers ... cont'd.

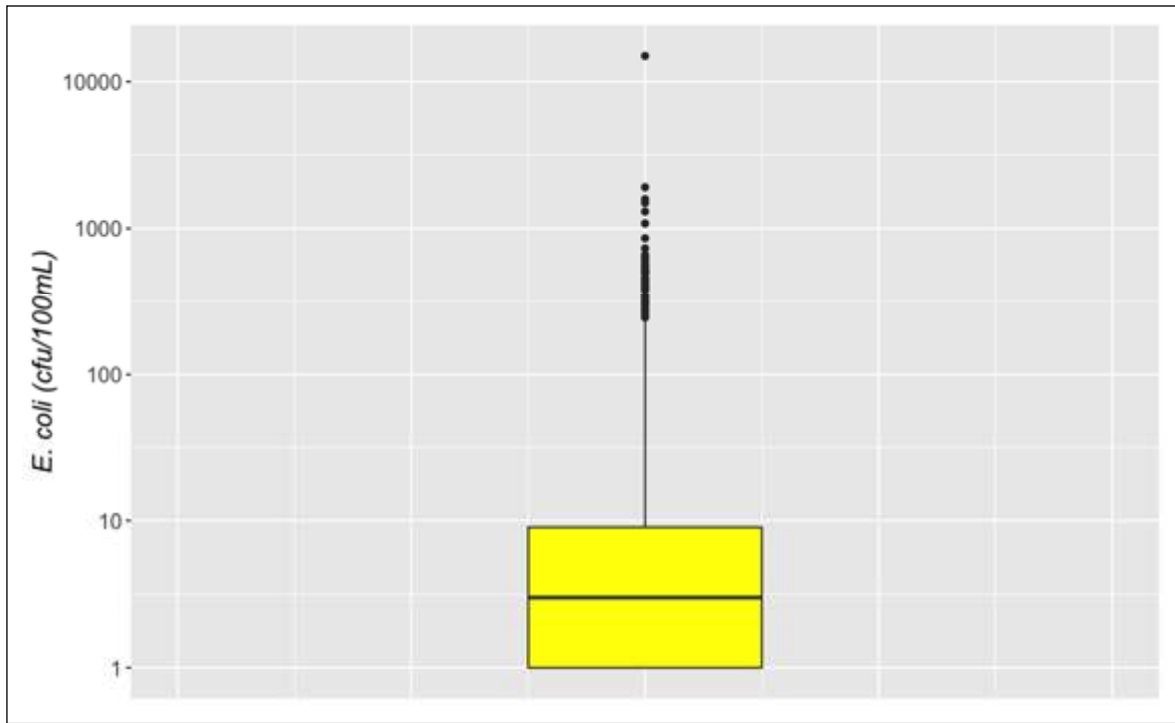


Figure 2 – *E. coli* concentration (cfu/100mL) in 11,351 samples collected from more than 900 sites in 18 Kawartha lakes from 2001 to 2025.

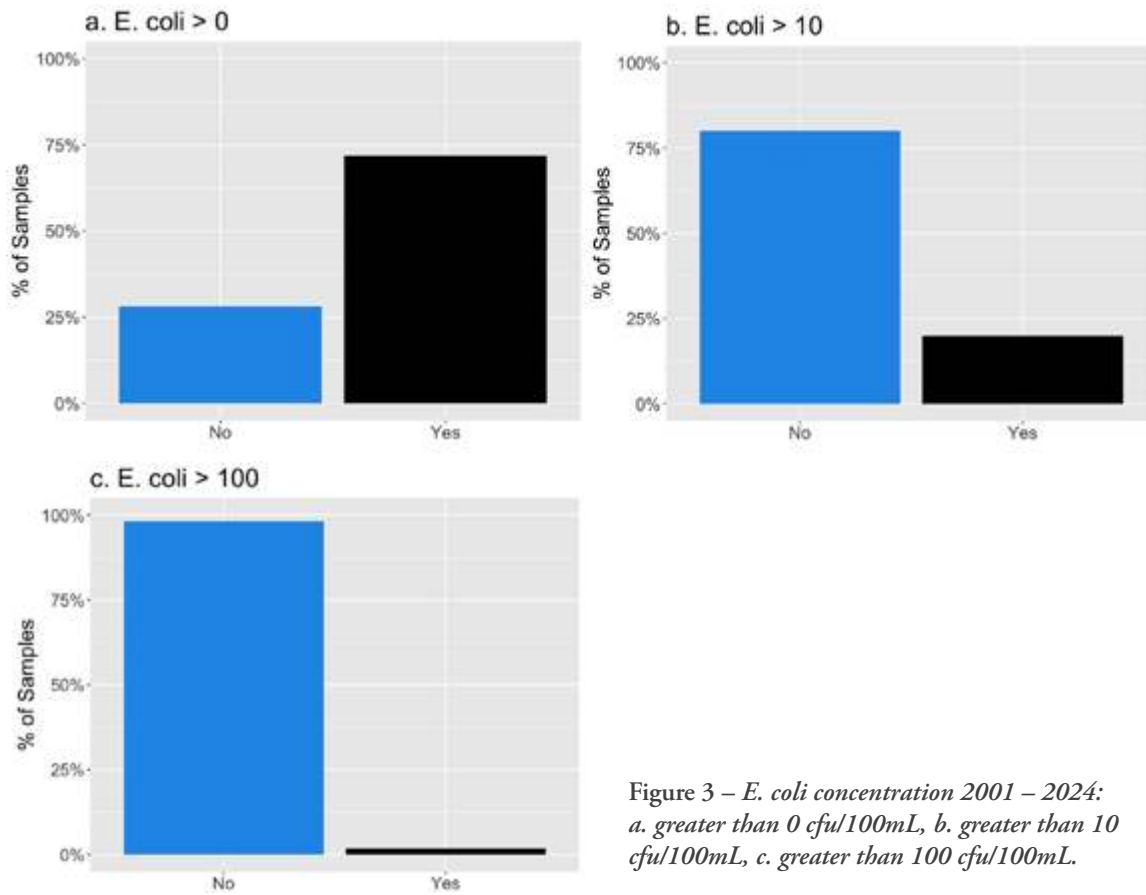


Figure 3 – *E. coli* concentration 2001 – 2024: a. greater than 0 cfu/100mL, b. greater than 10 cfu/100mL, c. greater than 100 cfu/100mL.

Climate Drivers ... cont'd.

to over 80% in 2004. Rain in the week just prior to sampling had a positive effect on *E. coli*, with about a 7% increased chance of a positive sample with 100mm or more rain. Rain two weeks prior actually had a negative effect on *E. coli*, with about a 4% decreased chance of a positive sample with 100mm or more rain. Although there was less variation in *E. coli* > 10 cfu/100mL, modeling showed independent effects of year and sampling weather in the week leading up to the sampling day. There was an increased chance of an *E. coli* count > 10 cfu/100mL with both higher average maximum temperature (about 4% greater chance with every 5°C increase) and higher total rainfall (about 1.5% greater

chance with every 100mm increase) in the week prior to sampling. There was very little variation in *E. coli* > 100 cfu/100mL, as 98% of the samples had counts less than 100.

The major, annual gradient in summer weather was from cold and wet to hot and dry years. There was a modest, negative relationship between the chance of a positive *E. coli* sample and this variation in summer weather largely driven by the large proportion of positive samples and cooler, wetter weather of 2004 (Figure 4).

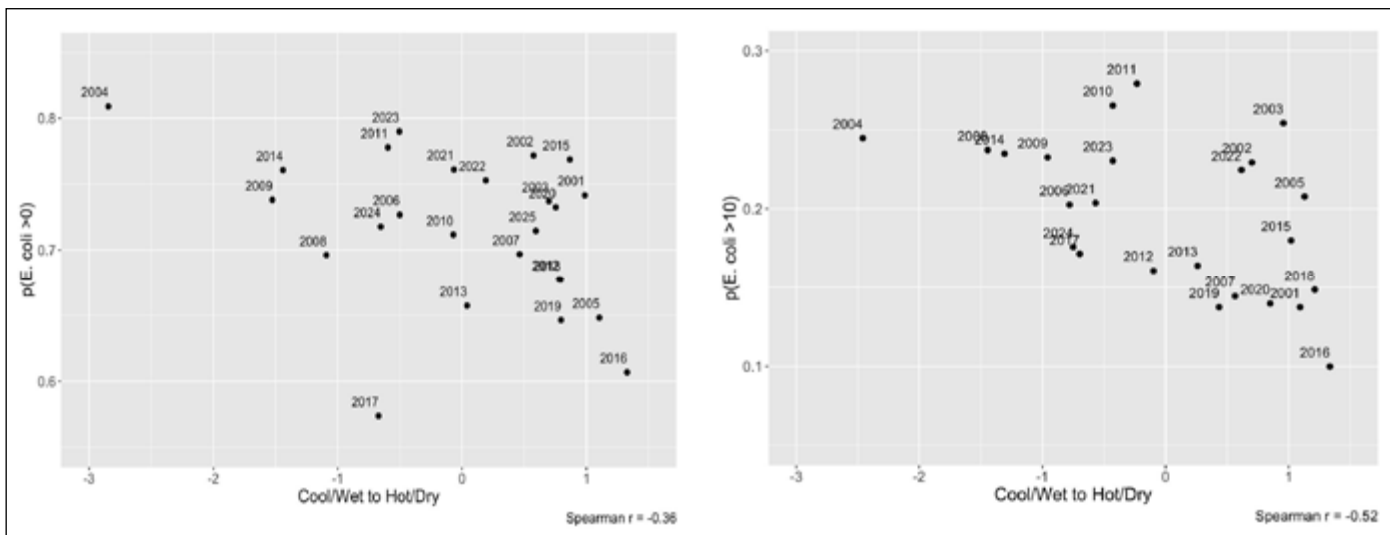


Figure 4 – The chance of an *E. coli* positive sample (top) and *E. coli* > 10 cfu/100mL (bottom) in relation to variation in annual summer weather in the Kawartha Lakes.

Discussion

In this study, we used data from more than 11,000 *E. coli* samples collected from 2001 to 2025 in a community science volunteer sampling program managed by the KLSA to assess air temperature and rainfall as predictors of *E. coli* concentration. Overall, there was very little *E. coli* in the samples – almost 30% had no *E. coli* and the median was only 2 cfu/100mL. We found that both air temperature and precipitation in the two weeks prior to sampling had significant but modest effects on *E. coli*; wet weather in the week just prior to sampling elevated the chance of a positive *E. coli* sample by a few percent, while wet weather one to two weeks prior to sampling actually reduced the chance of a positive sample by a few percent. Warmer, wetter

weather in the week prior to sampling also slightly increased the chance of an above median concentration of *E. coli* at the site.

These results are consistent with enhanced delivery from terrestrial sources during precipitation events (McKergow and Davies-Colley 2009, Hong et al. 2021), while the negative effect of rainfall two weeks prior suggests temporal dynamics in source availability, possibly related to depletion and rebuilding of *E. coli* reservoirs (Tornevi et al. 2014). Warmer temperatures in the week prior to sampling increased the probability of elevated *E. coli* concentrations (>10 cfu/100mL), supporting the role of temperature in *E. coli* survival (Jang et al. 2017, Sanchez et al. 2021, Desta et al. 2024).

There was substantially more variability among years

relative to the rather modest effects of weather in the two weeks prior to sampling. This was most striking when we modelled the chance of an *E. coli* positive sample, where the model predicted less than a 60% chance of a positive *E. coli* sample in 2017 but more than an 80% chance of a positive *E. coli* sample in 2004. Weather over the summer seems to play at least a partial role in affecting *E. coli* concentration. The cooler, wetter summer of 2004 had about a 15% greater chance of a positive *E. coli* sample than the warmer, drier summer of 2016. The negative correlation between summer weather was quite strong, especially for the chance of an *E. coli* concentration > 10 cfu/100mL. This emphasizes the importance of *E. coli* delivery to a site via runoff relative to its survival at a site in determining *E. coli* concentrations in these lakes (McKergow and Davies-Colley 2009, Hong et al. 2021). To be detected in a water sample from a site, most *E. coli* cells have to be delivered to the site, and all cells have to survive the physical and chemical conditions there.

In addition to the documented direct effects of temperature and precipitation on *E. coli* survival and delivery, and therefore survival, the weather also affects the ultimate sources of the *E. coli*, mammals (including humans) and birds (particularly waterfowl). This potential linkage is not part of our conceptual model, but may be an important part of untangling the causal link between weather and *E. coli* concentration. Even though we found significant strong (weather over the summer) and more modest (sampling weather) predictive relationships between weather and *E. coli* concentration, it is clear that most of the variation in *E. coli* was caused by factors that we were unable to model in this study. Probably the most important factors that we did not consider here are the characteristics of the sampling site that are either time invariant (e.g., turbulence at the site, and thus flushing rate) or temporally variable (e.g., waterfowl at or near the site). To adequately model at least some of these factors, we will identify a subset of the sites where landowners are agreeable to the specific location of the site and its attributes being used in modeling.

Climate change is expected to alter patterns of *E. coli* concentration in recreational waters like the Kawartha Lakes (Krupska et al. 2024), and our models based on historical data have shown that a changing pattern of precipitation will affect delivery of *E. coli* to the lakes and increasing air temperatures

will increase survival of *E. coli* in the lakes. However, site-specific characteristics such as the local abundance of waterfowl may also be affected by climate change, and interactions with these site effects may challenge the use of our models as predictive tools. Continued monitoring by community scientists, along with incorporation of site characteristics into our models, will be vital in helping Kawartha Lakes communities more accurately assess the risk from pathogens like *E. coli*.

References

- Blaustein, R., Y. Pachepsky, R. Hill, D. Shelton, and G. Whelan. 2013. *Escherichia coli* survival in waters: Temperature dependence. *Water Research* 47:569-578.
- Desta, B., J. Sanchez, C. Heasley, I. Young, and J. Tustin. 2024. Environmental factors associated with *Escherichia coli* concentration at freshwater beaches on Lake Winnipeg, Manitoba, Canada. *PLOS WATER* 3.
- Francy, D., E. Stelzer, J. Duris, A. Brady, J. Harrison, H. Johnson, and M. Ware. 2013. Predictive Models for *Escherichia coli* Concentrations at Inland Lake Beaches and Relationship of Model Variables to Pathogen Detection. *Applied and Environmental Microbiology* 79:1676-1688.
- Hong, Y., F. Soullignac, A. Roguet, C. L. Li, B. J. Lemaire, R. S. Martins, F. Lucas, and B. Vinçon-Leite. 2021. Impact of *Escherichia coli* from stormwater drainage on recreational water quality: an integrated monitoring and modelling of urban catchment, pipes and lake. *Environmental Science and Pollution Research* 28:2245-2259.
- Jang, J., H. Hur, M. Sadowsky, M. Byappanahalli, T. Yan, and S. Ishii. 2017. Environmental *Escherichia coli*: ecology and public health implications: a review. *JOURNAL OF APPLIED MICROBIOLOGY* 123:570-581.
- KLSA. 2002. 2001 Lake Water Quality Report. Kawartha Lake Stewards Association.
- Krupska, K. U., L. Speight, J. S. Robinson, A. J. Gilbert, and H. Cloke. 2024. Forecasting bathing water quality in the UK: A critical review. *WIREs Water* 11.
- McKergow, L. A., and R. J. Davies-Colley. 2009. Storm-flow dynamics and loads of *Escherichia coli* in a large mixed land use catchment. *Hydrological Processes* 24:276-289.

Climate Drivers ... cont'd.

R Core Team. 2021. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Sanchez, J., J. Tustin, C. Heasley, M. Patel, J. Kelly, A. Habjan, R. Waterhouse, and I. Young. 2021. Region-Specific Associations between Environmental Factors and *Escherichia coli* in Freshwater Beaches in Toronto and Niagara Region, Canada. International journal of environmental research and public health 18.

Stott, A. 2023. Determination of *Escherichia coli* in Aqueous, Soil, and Sludge Samples by Membrane Filtration.

Tornevi, A., O. Bergstedt, and B. Forsberg. 2014. Precipitation effects on microbial pollution in a river: lag structures and seasonal effect modification. Plos One 9:e98546.

Acknowledgements

We thank the many volunteer water samplers of over the 25 years considered in this study, and the Kawartha Lake Stewards Association for access to the data and continuing support. Ontario Tech University and the Kawartha Lake Stewards Association provided resources in support of this research.



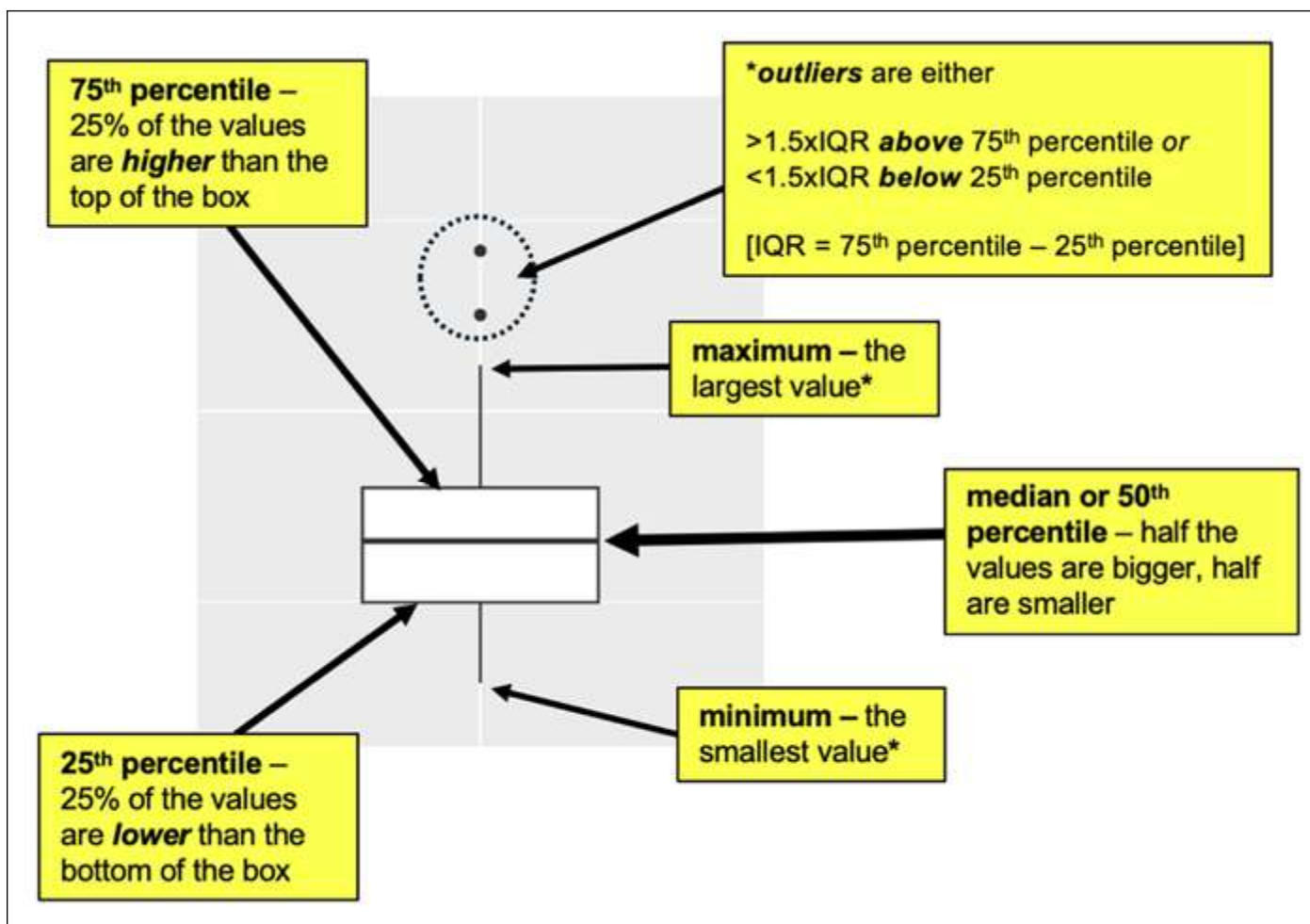
Photo contest entry: Surprise winter visitor. *Photo by: Pam Dickey, Buckhorn*

Making Sense of a Boxplot

Bob Bailey, KLSA Director, Professor of Science,
Ontario Tech University

In reporting the results of both the KLSA *E. coli* sampling program (p. 20) and the Lake Partner Program (p. 29), we use boxplots to show lots of information about a group of observations as

efficiently as possible. This makes comparisons among groups of observations much easier than looking at tables of numbers.



The figure above defines each part of the boxplot. I first take a look at the **median**, which is the value for which half the observations are bigger and half are smaller. It's a bit more reliable than the mean, since it isn't affected by a few extreme big or small values. The next thing I assess and compare is the height of the box (**IQR** – interquartile range), which gives me an idea of how variable the numbers were in this group. Like the median, the top (75th percentile) and bottom (25th percentile) of the box are defined by several observations, not just the single biggest and smallest values. For these, I look at what are

known as the “whiskers” on the top (**maximum**) and bottom (**minimum**) of the box. Finally, **outliers** are observations that are, strange to say, bigger than the maximum or smaller than the minimum. The arbitrary definition of outliers in a boxplot are those that are more than 1.5 times the height of the box, bigger than the top of the box or smaller than the bottom of the box. Sometimes groups of observations have outliers, sometimes they don't. You can see that in the boxplot above - there are two outliers!

Lake Partner Program in the Kawartha Lakes: 2024 Results

Bob Bailey, *KLSA Director, Professor of Science, Ontario Tech University*

The Lake Partner Program (LPP) is a collaboration of the Ontario Ministry of the Environment, Conservation & Parks (MECP) with the Federation of Ontario Cottagers' Associations (FOCA).

The data presented here are from Kawartha Lakes that were sampled by volunteers in our community in 2024:

P (µg/L) – concentration of **Phosphorus** in the water, an important nutrient for plants and algae and sometimes too high from human activity

Ca mg/L – concentration of **Calcium** in the water, an important nutrient for all organisms, especially molluscs

Cl mg/L – concentration of **Chloride**, occurs naturally but sometimes at damaging levels due to human activity like road salting

S mg/L – concentration of **Sulphate**, occurs naturally but sometimes at damaging levels due to human activity and acid deposition

Secchi Depth (m) – how clear the water is, measured by lowering a disk until you can't see it, so the deeper the Secchi depth the clearer the water. Suspended material and algal blooms can reduce the clarity and thus the Secchi depth.

This dataset was downloaded from the LPP website (foca.on.ca/lake-partner-program/), where data

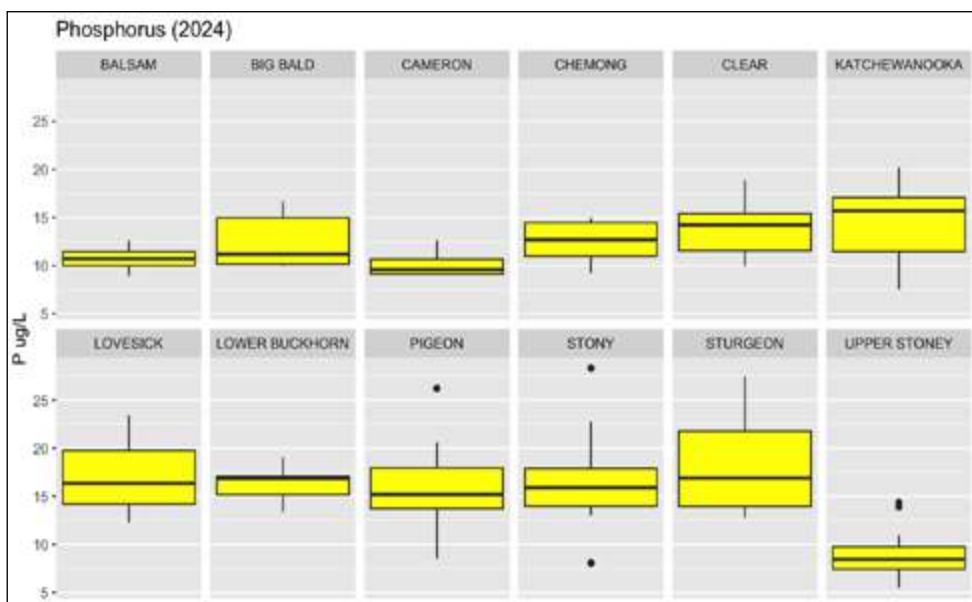
from the past 20+ years from samples of lakes across Ontario (including the Kawartha Lakes) can be examined or downloaded.

Visit the KLSA website to download LPP data from our Kawartha Lakes collected by volunteers over the last 25+ years! If you don't see your lake below, you can contact the LPP program from their website and find out about becoming an LPP volunteer lake scientist!

Lake	# Observations in 2024
Balsam	12
Big Bald	6
Cameron	4
Chemong	5
Clear	10
Katchewanooka	11
Lovesick	10
Lower Buckhorn	9
Pigeon	15
Stony	12
Sturgeon	5
Upper Stoney	24

Phosphorus

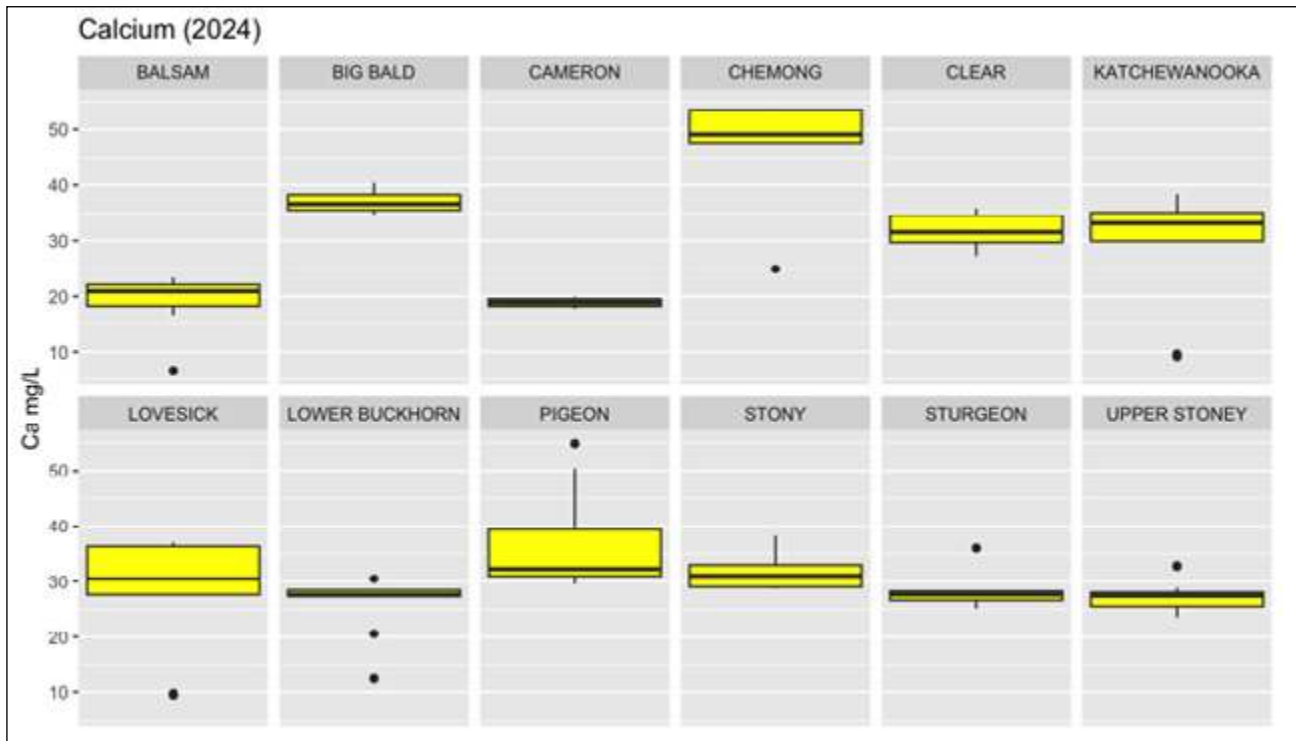
Among the LPP lakes sampled, Phosphorus was notably lower in Upper Stoney, consistent with its drainage from shield geology and largely out of the main flow of the Trent-Severn Waterway.



Lake Partner Program ... cont'd.

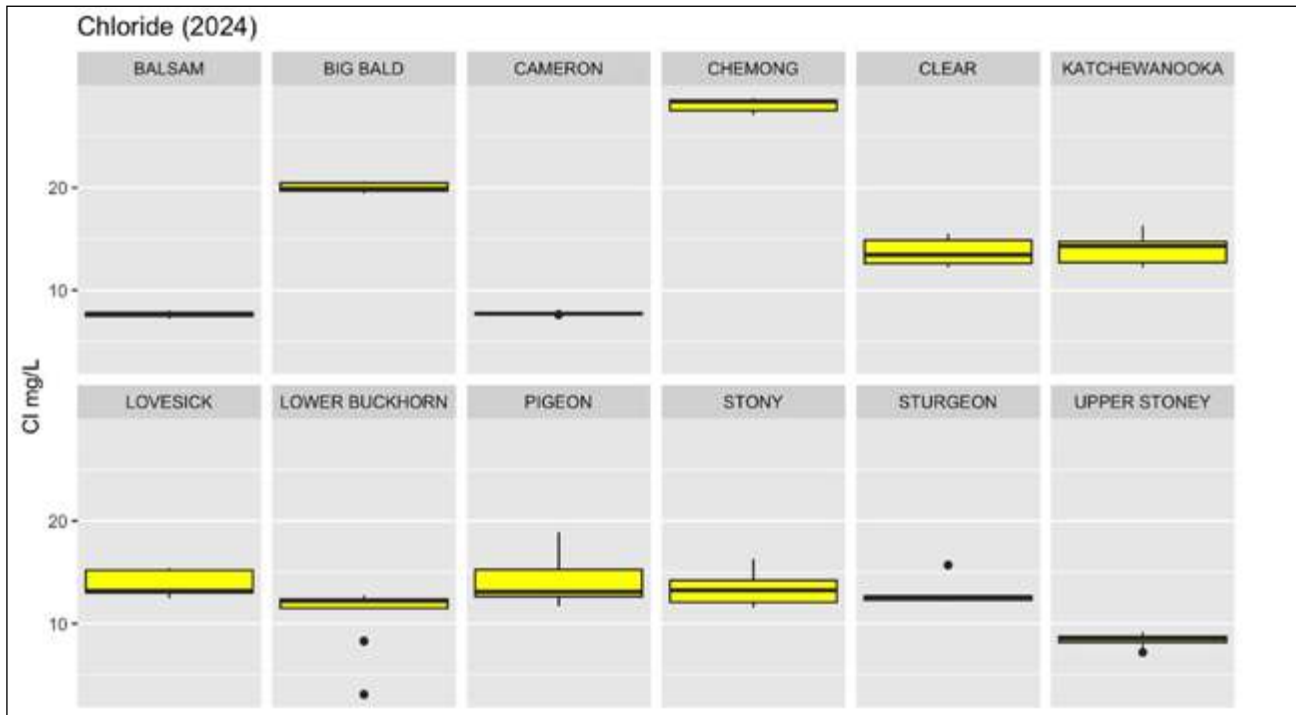
Calcium

Chemong Lake was notable for its high Calcium levels relative to the other Kawartha lakes sampled.



Chloride

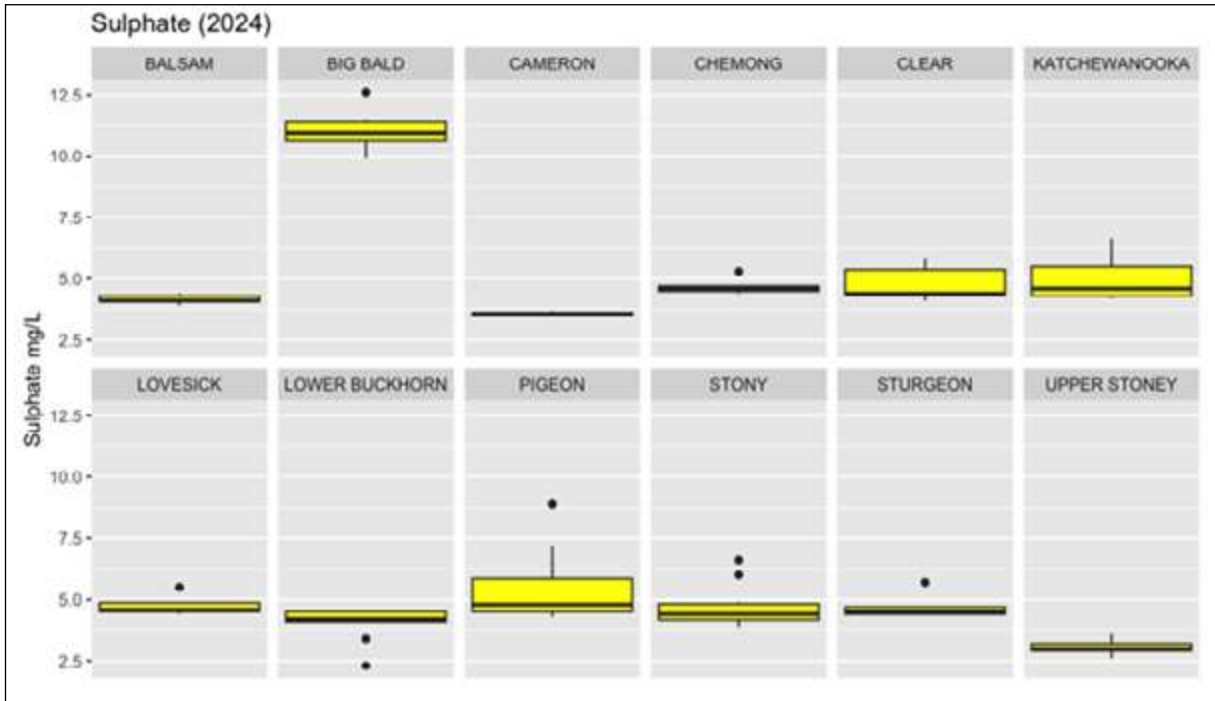
Chemong Lake had by far the most Chloride, perhaps indicative of the causeway runoff and other sources of road salt.



Lake Partner Program ... cont'd.

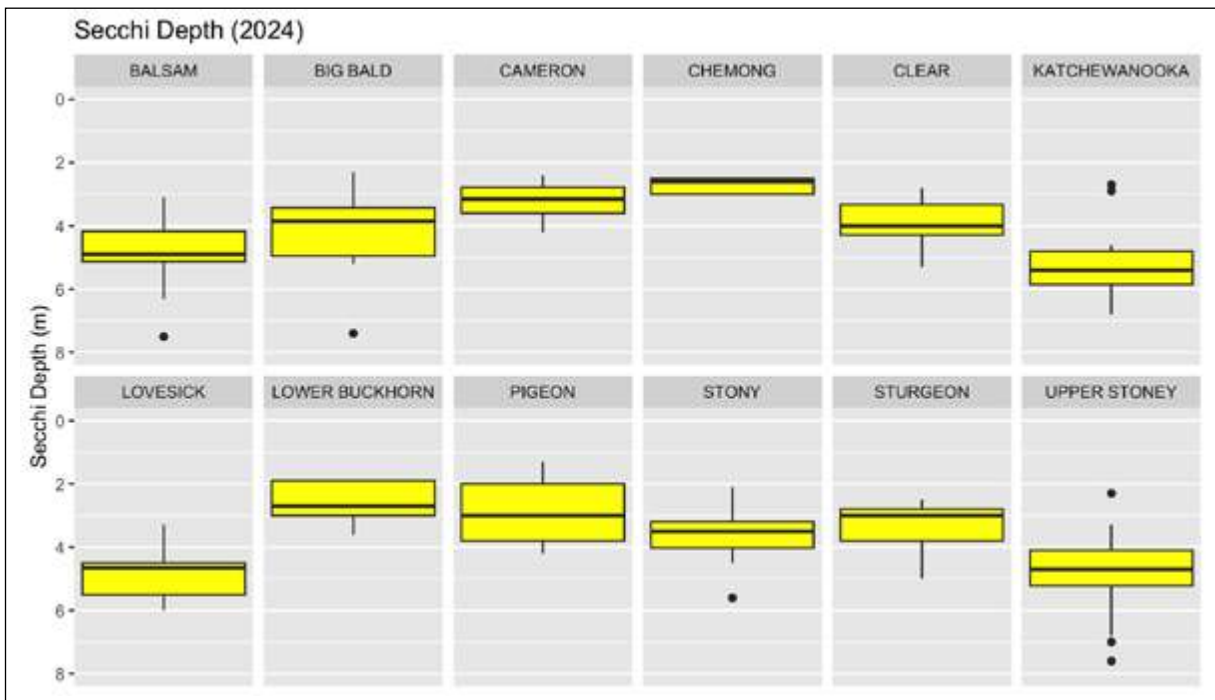
Sulphate

Big Bald seems to have the most Sulphate among the lakes sampled in 2024. Perhaps its surficial geology or other human or natural sources are responsible for this difference.



Secchi Depth

Note the reverse axis on the Secchi Depth plots. Think of the top of the plot as the surface of the water, and the lower the boxplot the clearer the water! Katchewanooka, Lovesick, and Upper Stoney seemed to be the clearest water in 2024, while Chemong was the most turbid when its Secchi Depth was measured.



Lake Partner Program in the Kawartha Lakes: 2000-2024

Bob Bailey, *KLSA Director, Professor of Science at Ontario Tech University*

Gavin Vance, *Stewardship Coordinator of Lake Partner Program, Federation of Ontario Cottagers' Associations*

The Lake Partner Program (LPP) is a collaboration of the Ontario Ministry of the Environment, Conservation & Parks (MECP) and the Federation of Ontario Cottagers' Associations (FOCA). The LPP has been in operation since 1996, adding low-level total phosphorus analysis in 2002. Currently the program has over 600 active volunteers and monitors over 500 lakes in Ontario, many of which are in the Kawartha Lakes region. Through the LPP, over 5000 data points are produced annually, all of which help contribute to lake health science. Through the LPP, FOCA is also able to produce educational materials that help strengthen the knowledge of lake stewards and

seasonal and year-round residents across Ontario. If you are interested in reading any of these materials or learning more about the LPP or FOCA please visit FOCA's webpage on the LPP (foca.on.ca/lake-partner-program/). If you have questions about the LPP, please reach out to lakepartner@foca.on.ca.

As you can see from the long-term datasets presented below, members of the Kawartha Lakes community have been active participants in the Lake Partner Program since the very beginning. Visit the KLSA website to download LPP data from our Kawartha Lakes collected by volunteers over the last 25+ years. If you don't see your lake below, you can contact the LPP program from their website and find out about becoming an LPP volunteer lake scientist!

The following brief summaries of each LPP parameter show findings from 2024 and trend lines from 2000-2024. The Kawartha lakes sampled and the number of observations in each lake were as follows:

Lake	# Observations in 2024
Balsam	12
Big Bald	6
Cameron	4
Chemong	5
Clear	10
Katchewanooka	11
Lovesick	10
Lower Buckhorn	9
Pigeon	15
Stony	12
Sturgeon	5
Upper Stoney	24

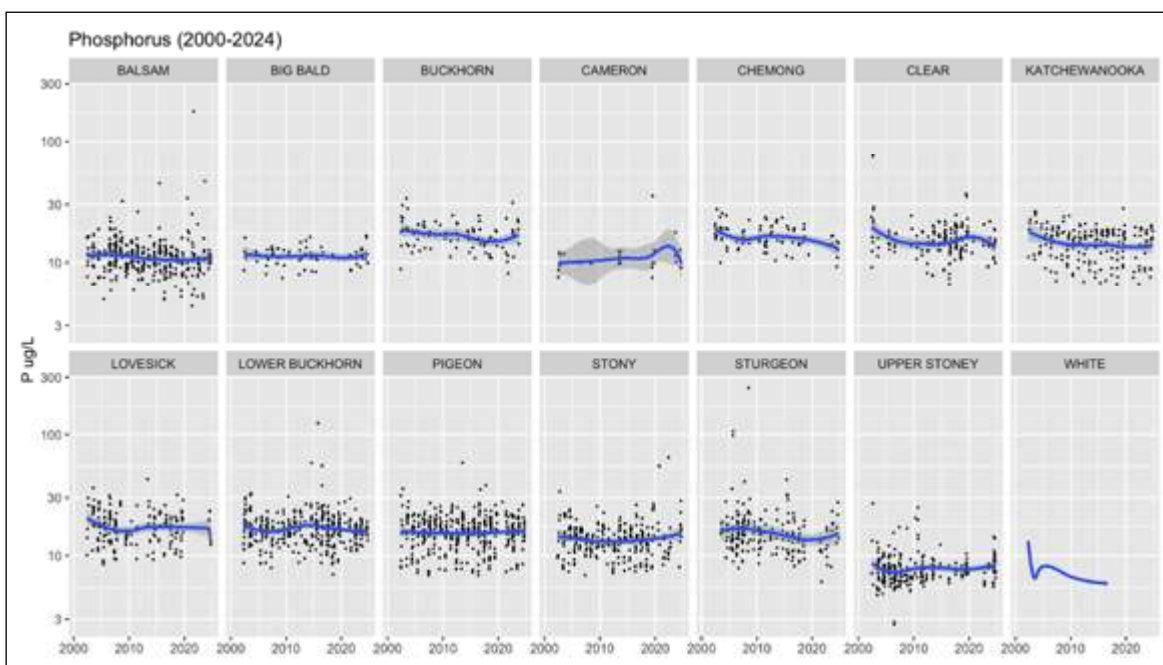
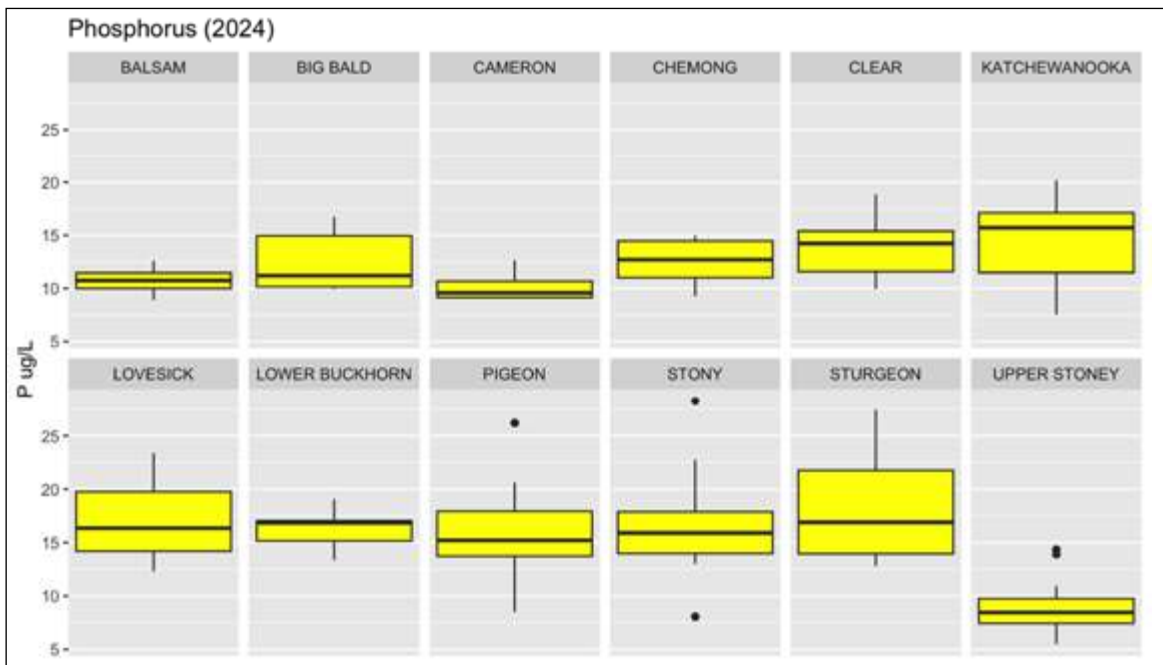
Lake Partner Program ... cont'd.

Phosphorus

Phosphorus in the water is an important nutrient for plants and algae and is sometimes elevated by human activity (e.g., agriculture). Phosphorus comes from the lake's drainage basin, including inflows like the Trent-Severn Waterway and the surrounding residences and farms. It also gets regenerated from the sediment, primarily over winter. In Ontario, safe total phosphorus (TP) levels to prevent excessive algal growth are generally below 20µg/L, with an

ideal target of 10µg/L or less for many lakes to avoid aesthetic deterioration.

Phosphorus in the LPP Kawartha lakes has not changed appreciably over 25 years. Upper Stoney is usually below 10µg/L, consistently lower than the other lakes, which is consistent with its drainage from shield geology and largely out of the main flow of the Trent-Severn Waterway. Other Kawartha lakes are usually, but not always, below 20µg/L.



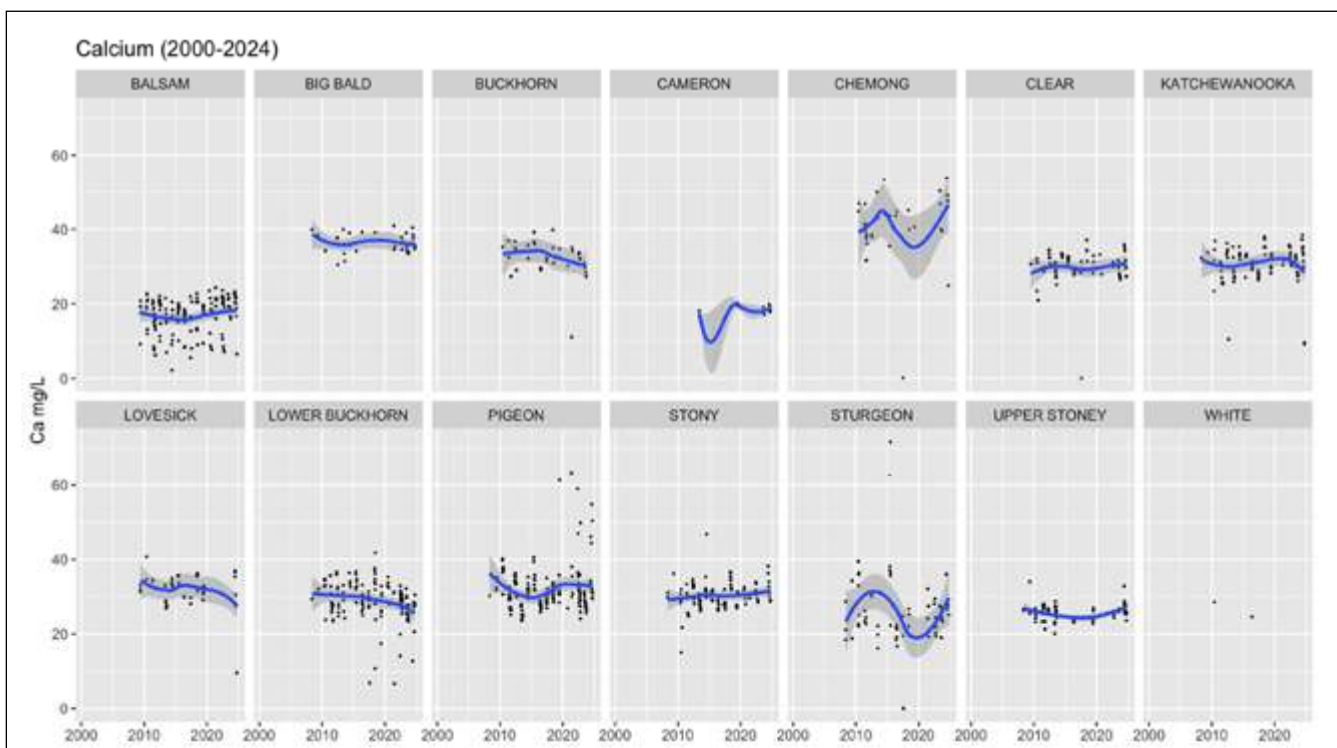
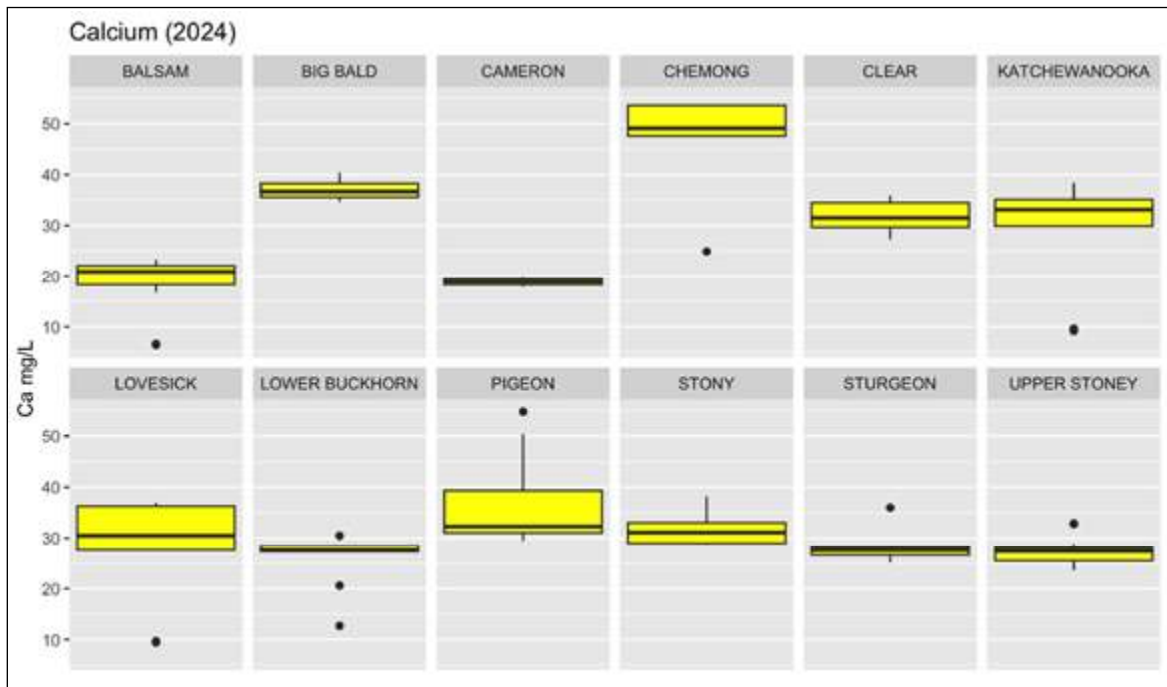
Lake Partner Program ... cont'd.

Calcium

Calcium is an important nutrient for all organisms, especially snails and clams. It comes from the lake's drainage basin, including inflows like the Trent-Severn Waterway.

Chemong Lake is notable for its consistently high

calcium levels relative to the other Kawartha lakes. This may be a reflection of both its watershed and human activity, as calcium sulphate often is used as a 'road salt'. Chemong and all the other Kawartha lakes are well below the safe level of 300mg/L.

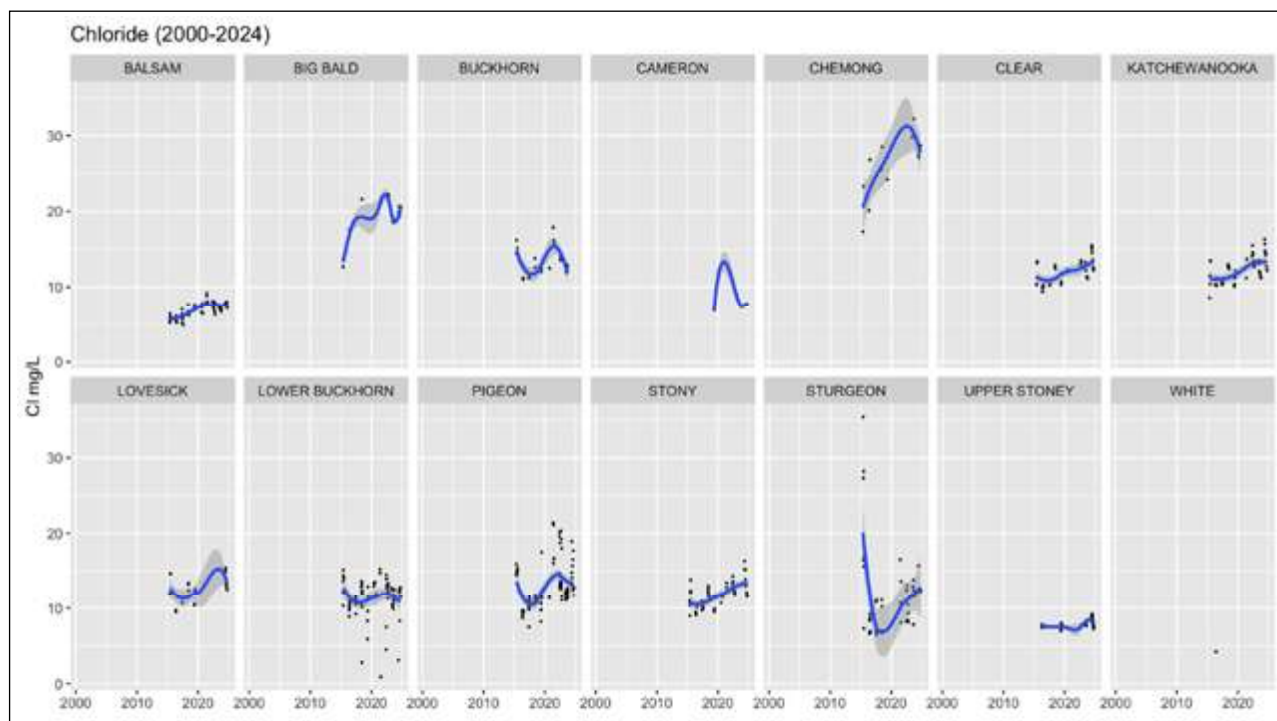
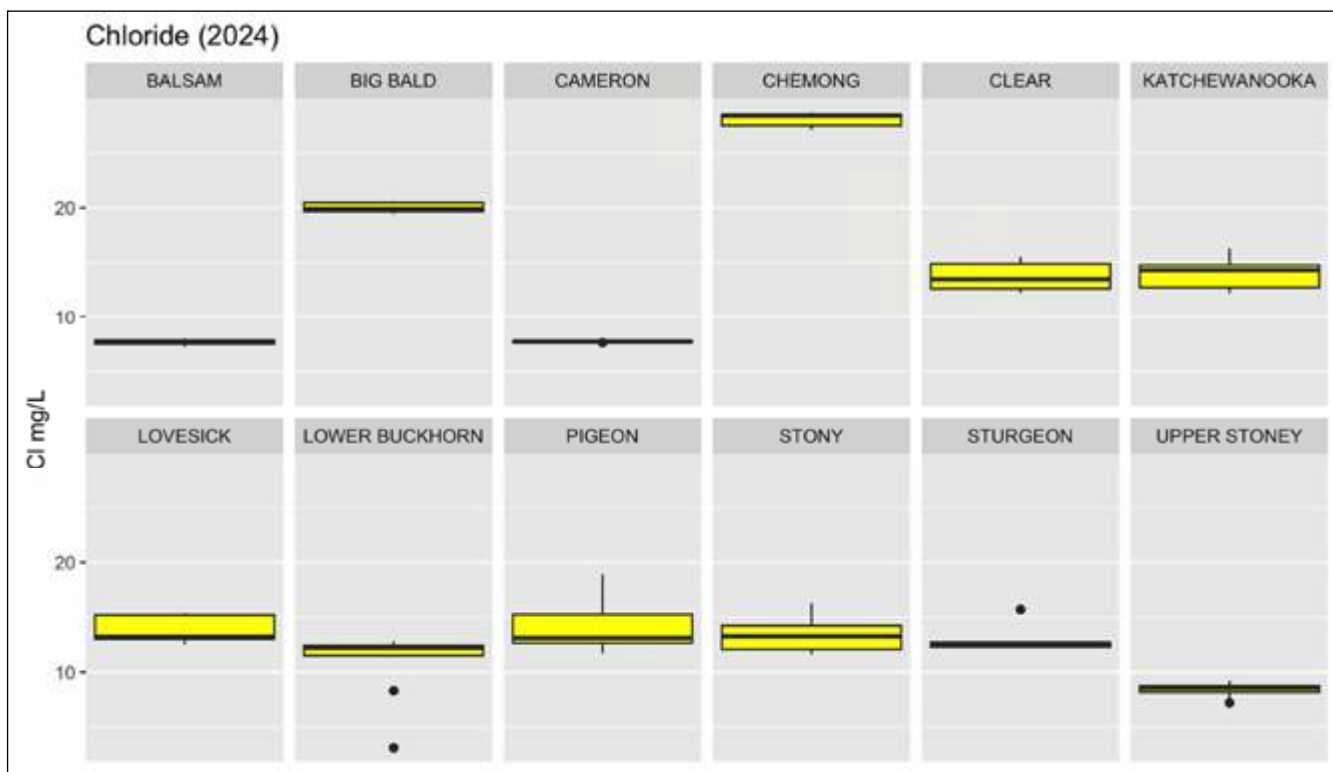


Lake Partner Program ... cont'd.

Chloride

Chloride comes from the lake's drainage basin, including inflows like the Trent-Severn Waterway. It is essential for most biota but sometimes reaches damaging levels due to human activity like road salting.

Chemong Lake consistently has the highest chloride levels, perhaps indicative of the causeway runoff and other sources of road salt. It is still well below 120mg/L, considered a safe level for aquatic organisms.



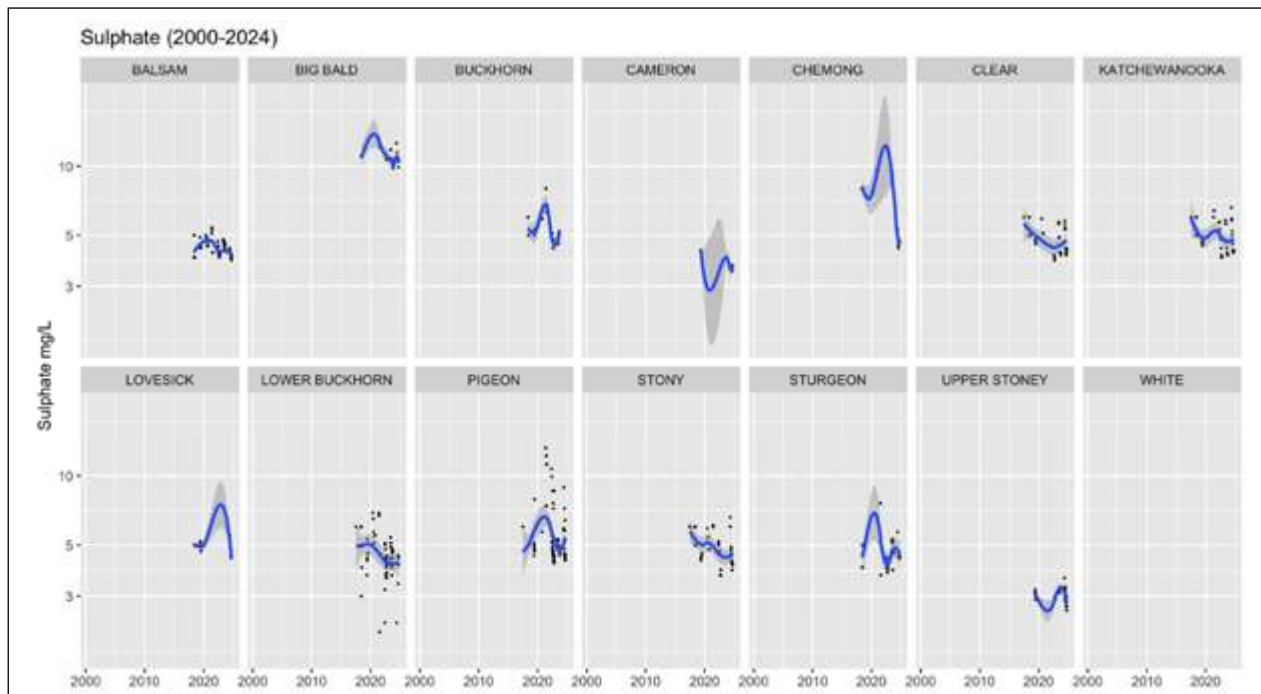
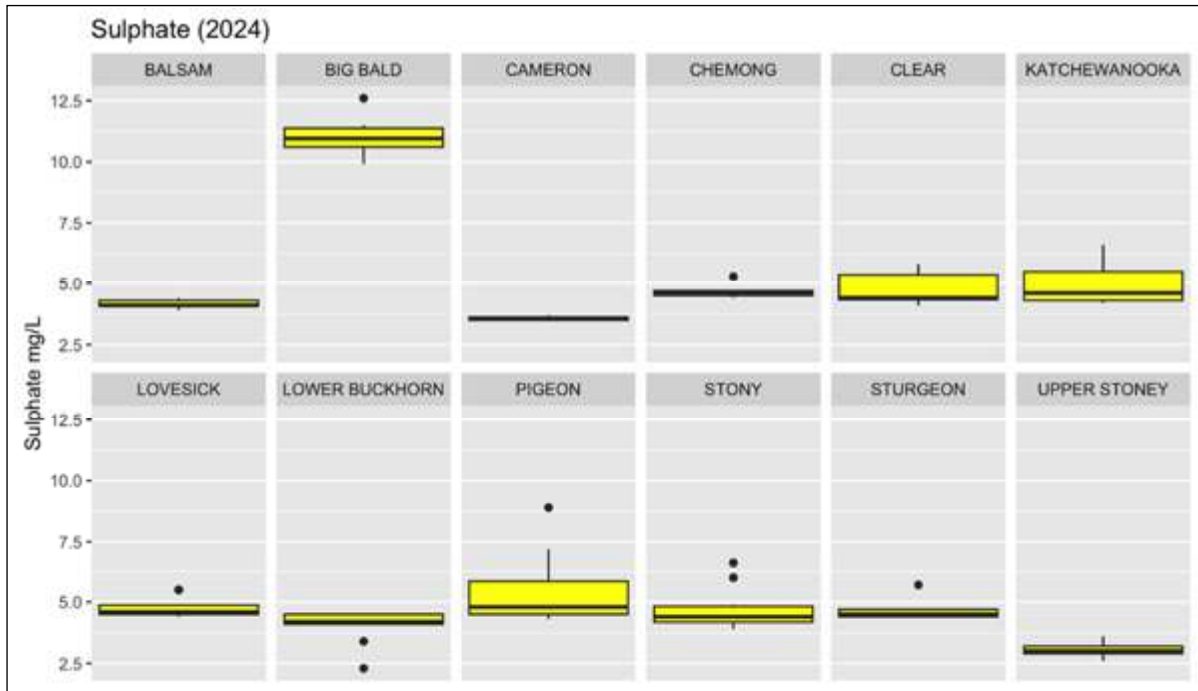
Lake Partner Program ... cont'd.

Sulphate

Sulphate comes from the lake's drainage basin, including inflows like the Trent-Severn Waterway. It occurs naturally but sometimes at damaging levels due to human activity from acid deposition on the surrounding drainage basin and the lake itself.

Sulphate analysis has only been done for the last few

years in the Lake Partner Program. Although the data are pretty sparse, Big Bald seems to have the most sulphate among the Kawartha LPP lakes. Perhaps its surficial geology or other human or natural sources are responsible for this difference. It is well below the safe level of 500mg/L or the 'taste level' of 150mg/L in all Kawartha lakes that are monitored.



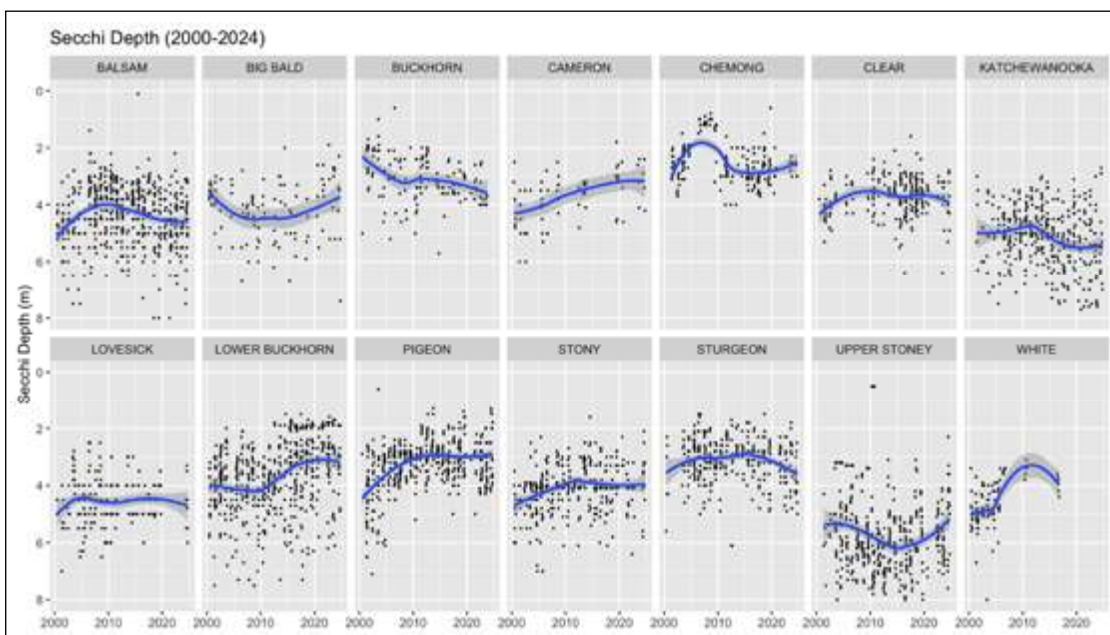
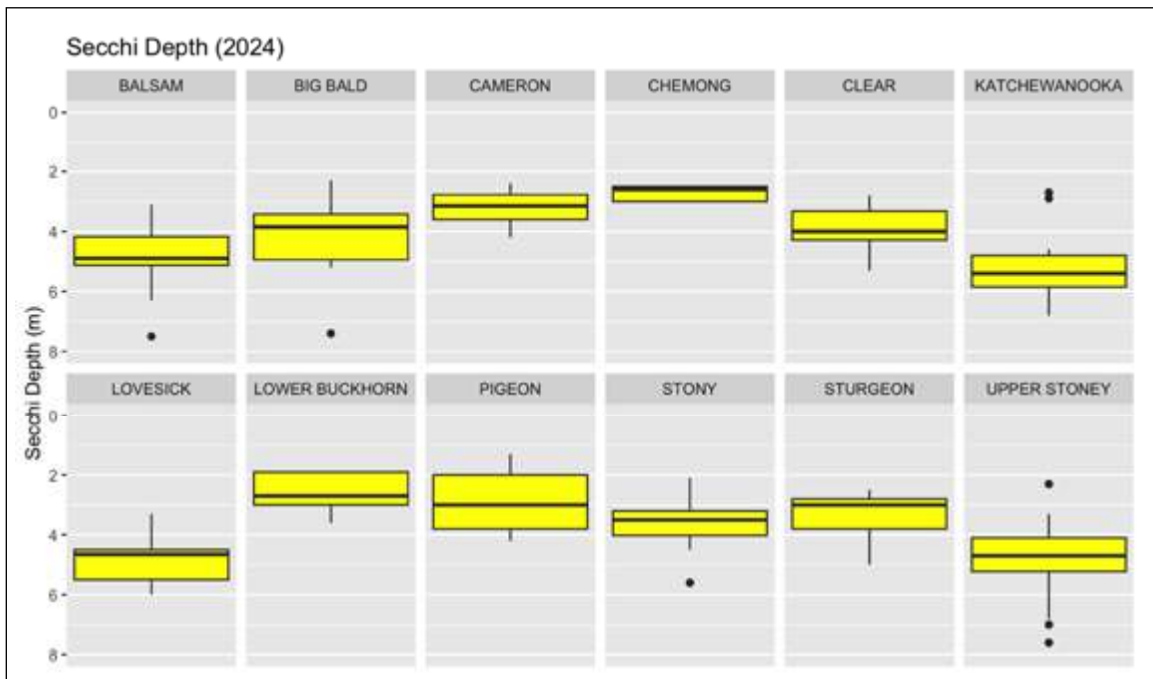
Lake Partner Program ... cont'd.

Secchi Depth

Secchi Depth has been measured in the LPP since 1980 as it is an easy way to measure how clear the water is... you just lower a black and white disk into the water until you can't see it, and measure how deep the disk is. The deeper the Secchi depth, the clearer the water. The Secchi Depth is affected by suspended material and algal blooms, so it varies a fair bit through the open water season. It is also affected by what kind of day (e.g. sunny) and what

time of day the reading is taken. On the plots below, note the "reverse y-axis"... think of the top of the plot as the surface of the water, and the lower the boxplot or point on the graph, the clearer the water!

There is obviously lots of scatter in the data, but Katchewanooka and Upper Stoney seem to usually be the clearest of the lakes while Chemong tends to be the most turbid.



Municipality of Trent Lakes Environmental Advisory Committee: Water Subcommittee

Carol Armstrong, Deputy Mayor,
Municipality of Trent Lakes

The Municipality of Trent Lakes established an Environmental Advisory Committee (EAC) in 2024, with a mandate to advise, provide guidance, and make recommendations to Council on environmental issues including the protection, conservation, and enhancement of natural systems and resources.

The EAC is focused on water, land and sky stewardship, with subcommittees for each. The Water Subcommittee is concerned with the health and quality of lakes and rivers in Trent Lakes, the negative pressures on them, and the ways in which the municipality can encourage and support continued good aquatic health.

The first initiative of the Subcommittee was to promote awareness of how each of us can avoid practices that damage water health. The science is clear that the three largest contributors to deteriorating water quality are:

- 1) inadequate and malfunctioning septic systems,
- 2) use and application of chemicals, pesticides and fertilizer, and
- 3) not maintaining a natural shoreline.

Most waterfront property owners understand that the financial, recreational, and future value of their real estate asset is dependent on the continued health of their lake or river. When they understand their role in preserving that value, there is strong motivation to take action. The Subcommittee recommended to Council that they “Educate, before you Regulate”.

The Subcommittee researched scientific papers, reviewed informational handouts prepared by other municipalities, and conversed with experts in the field of water quality. It developed a brochure to educate, guide, and encourage residents to look after their own shorelines. The brochure was mailed out in 2025 to every taxpayer in the municipality – over 7,000 – along with their tax bill. It is also available in libraries, community halls, and the municipal office.

<https://www.trentlakes.ca/media/clrlbyz4/water-front-property-owners-double-sided-flyer.pdf>

Building on its awareness campaign for healthy lakes, the Subcommittee is exploring the possibility of a

Shoreline Protection bylaw. Protections already exist in the Provincial Policy Statement, the County Official Plan, and the Municipal Comprehensive Bylaw, but specific requirements are largely focused on setbacks from water bodies and site plan agreements for new development. The County of Haliburton recently implemented a Bylaw requiring any shoreline property owner to apply for a permit before embarking on any alterations to their shoreline property, restricting excessive site alteration, destruction of natural shorelines, and overdevelopment. Trent Lakes is considering a less onerous approach, without permits, but at the time of this writing (February), a Shoreline Protection Bylaw continues to be in the discussion stages.

The municipality already takes an active role in protecting our shorelines and water health. The Comprehensive Zoning Bylaw (due to be updated in 2026) provides a balance of landowner rights with protections for our water bodies and natural assets. Importantly, since 2016, Trent Lakes has managed a discretionary septic inspection program, targeting 300 properties per year. Not only has this program identified about a 10% failure rate in septic system operation, it has also served as a catalyst for owners to pump out, repair, or replace their systems in advance of the inspections. The program is temporarily paused during the transition from Peterborough Public Health to the municipality, however 2026 will see a targeted focus on Short Term Rental septic systems.

The Subcommittee also completed an inventory of over forty-five named lakes in the municipality. Information on the characteristics and water quality for most of these exists, but resides in a plethora of organizations and data bases. We wanted to get a better picture of the lakes within our geography and understand any areas of concern or risk. Researching available sources, such as Kawartha Lake Stewards Association Annual Lake Water Quality Reports, Ontario Lake Partner Program, Trent University’s Trent Aquatic Research Project, Watershed Canada’s Love Your Lake Program, and other public sources, a complete inventory was compiled. This information has been shared with Council and Staff and is being used to:

- 1) Provide a resource to assist with municipal Land Use Planning
 - Zoning Bylaws, Amendments and Minor Variances
 - Planning Applications

Municipality of Trent Lakes Environmental Advisory Committee: Water Subcommittee ... cont'd.

2) Assess Health of Lakes in the municipality

- Phosphorous, Calcium, Chloride, Clarity, Dissolved Oxygen
- Aquatic Invasive Species
- Natural Shorelines

3) Guide stewardship activities of the municipality

Finally, the Subcommittee recommended to Council an enhancement to staff reports. It was approved,

and an additional section titled "Environmental Implications" has been added to staff reports to Council. This ensures that Council gives consideration to any adverse (or positive) impacts of decisions on the environment.

For further information about the Subcommittee or any of its activities, please contact Carol Armstrong, Deputy Mayor of Trent Lakes: carmstrong@trentlakes.ca.

Natural Shorelines

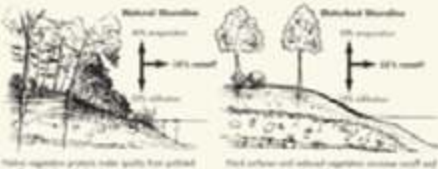
The few metres below and above the shoreline are a very important "Ribbon of Life". Ninety percent of all lake life is born, raised and fed in the area where the land and water meet. The shallow water and the first 10-15 metres of shoreland form a ribbon of life around lakes and streams that is essential to the survival of many species. This rich and complex habitat supports plants, micro-organisms, insects, amphibians, birds, mammals and fish.

Unaware of the importance of shoreline vegetation, many landowners clear their shorelines and transform them into urban landscapes. They destroy the cattails, bulrushes and other native species. They build retaining walls, docks and boathouses. These changes destroy the balance of the aquatic and shoreline ecosystems. They also alter wildlife habitat, natural beauty and character of our lakes and streams. And they negatively impact the health of the lake or stream.

Natural shoreline vegetation plays an important role in preventing soil erosion. Plant roots anchor the soil, preventing shoreland from being washed away by currents, waves and rain. The roots of mature trees reach down to the upper levels of the water table. Dogwood and meadowsweet roots form a web that extends a half metre downward. These native species are far more effective in protecting properties from erosion than the roots of grasses, which only reach 8 cms below the surface.

By preventing erosion and runoff, natural shoreline vegetation also improves water quality. When soil and excess nutrients are washed into the water, fish spawning beds can be destroyed, dissolved oxygen is depleted, and the growth of algae and aquatic plants is encouraged. The deeper roots from native trees, shrubs and grasses intercept groundwater and runoff,

Natural Shorelines (Cont'd)



and help extract harmful chemicals like phosphorus from the groundwater flow before it enters the waterbody. Shoreline vegetation also improves water quality by shading and cooling shallow water.

Negative changes in water quality can lead to rapid eutrophication – the aging of a lake. Eutrophication of a lake ultimately changes the kinds and numbers of species that can live there.


A shoreline buffer of native plants captures runoff and contaminants from reaching the water. Protect your shoreline with native plants, shrubs and trees that are best adapted to your region in Canada. As a bonus, tall native grasses and shrubs deter geese from coming up onto your property and leaving their droppings.

Best Practice – A healthy buffer zone, or "the ribbon of life", is potentially the most important factor in protecting the quality of water of our lakes for future generations to enjoy. As a best practice, every waterfront property owner should strive to maintain 75% of the buffer zone in its natural state.

Programs and assistance are available through Watersheds Canada and local Lake Associations.

Sample of Native Trees, Native Shrubs and Plants:

- White Pine, Red Pine, White Birch, White Cedar, White Spruce, Red Oak, Sugar Maple
- Alternate Leaf, Dogwood, Nannyberry, Chokeberry, Fragrant Sumac, Creeping Juniper, Serviceberry
- Canada Anemone, Helen's Flower, Black-eyed Susan, False Sunflower, Switchgrass



The quality and continued health of our many lakes and rivers are very important to all of us. The Municipality of Trent Lakes strives to work with its residents, visitors, and various organizations to preserve and protect our natural resources.

We recognize the important role of the First Nation Communities in the Treaty 20 area. They have provided ongoing stewardship and responsibility for the abundant lakes and rivers in their traditional territory for millennium.

The Municipality of Trent Lakes will continue to build on this relationship with First Nation Peoples to care for our natural resources with a traditional knowledge and scientific lens to protect it for your family and for future generations to come.

The Trent Lakes Official Plan (OP) encourages development that preserves, as much as possible, a site's environmental assets. Specific references include OP Section 9 - Water Resources and OP Section 9.4 - Shoreline Development and Setback.

The Comprehensive Zoning Bylaw B-2014-070 provides a balance of landowner rights with protection of our lakes and rivers. New homes shall be set back at least 30 metres from the high water mark, with minimal disturbance of the native soils and very limited removal of shoreline vegetation. Rebuilds shall maintain, at a minimum, the existing setback from the water and minimize the impact on shoreline vegetation.

NOTE: New shoreline and tree protection bylaws are under consideration for 2023.

Additional Resources
www.foca.on.ca
www.cohpoa.org
www.naturaledge.watersheds.ca
www.kisa.ca
www.kawarthaconservation.com

Community Science - The Power of Volunteers

Nathan Rajevski, Watershed Resource Technician,
Kawartha Conservation

In its second year, the Community Science Program has continued to grow following the success of 2024. Tracking water quality remains central to understanding the ecological balance of our lakes while informing local conservation efforts. Over the past year, we have seen how engaging residents directly at their docks has expanded our total monitoring capacity and strengthened community stewardship. Lake residents or 'Citizen Scientists' now play an active role in collecting valuable data on water quality from the following lakes: Pigeon Lake, Sturgeon Lake, Cameron Lake, Balsam Lake, and Lake Scugog.

The program aims to strengthen residents' knowledge of their lakes and the shared responsibility of protecting them by engaging the community in science-informed activities. In 2025, we increased the number of volunteers contributing to the program to 28 in total and are now collecting samples on Lake Scugog. Volunteers are tasked with monitoring nearshore water quality by providing monthly samples from May to September, which are analysed at an accredited laboratory for phosphorus, nitrates, chloride and *Escherichia coli* (*E. coli*). Volunteers also record water temperature and conductivity using a water quality probe.

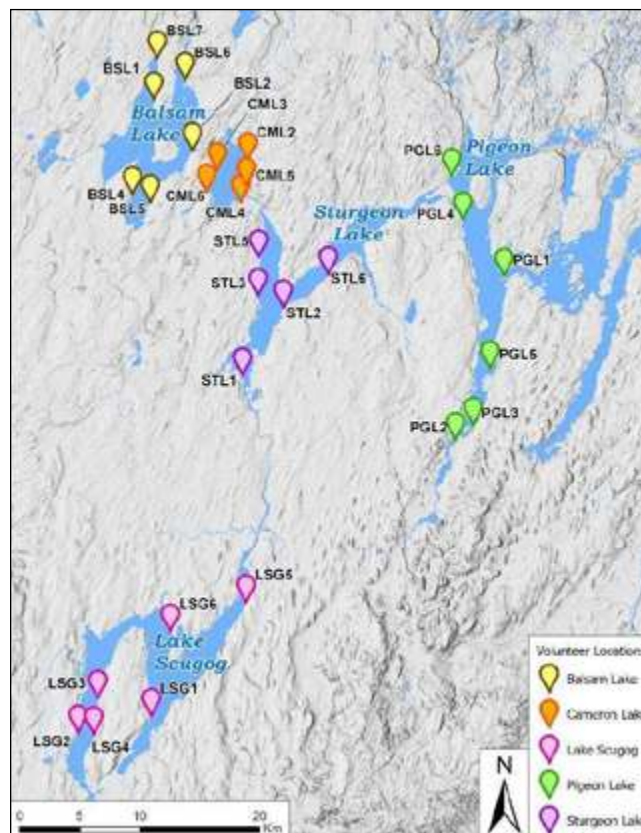
2025 Results

This year, we based our results off the 123 nearshore water quality samples collected by volunteers across the 5 different lakes within our study area. These results were compared to Provincial Water Quality Objectives and Canadian Water Quality Guidelines for Aquatic Life to assess the current health of nearshore environments, allowing us to better identify any emerging issues within our lakes.

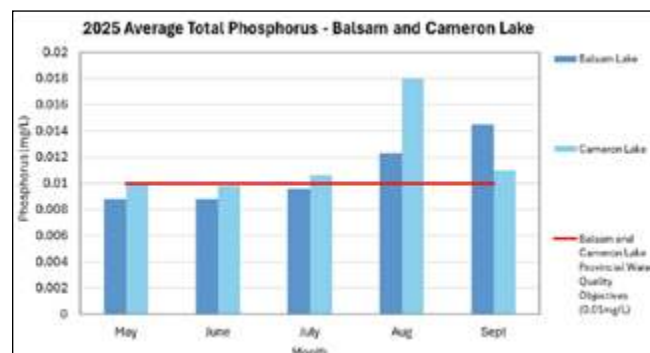
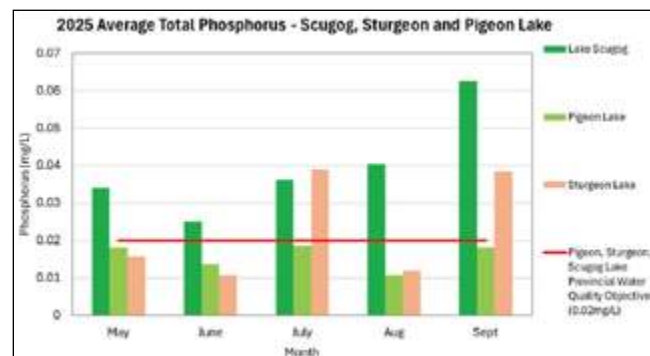
Total Phosphorus

Nearshore environments are especially vulnerable to phosphorus inputs from shorelines and nearby land activities, which can lead to increased aquatic plant and algal growth. Phosphorus concentrations across the five lakes were generally higher throughout the mid to late summer months, with notable increases observed in July, August and September.

During these months, several sites exceeded Provincial Water Quality Objectives, indicating periods of



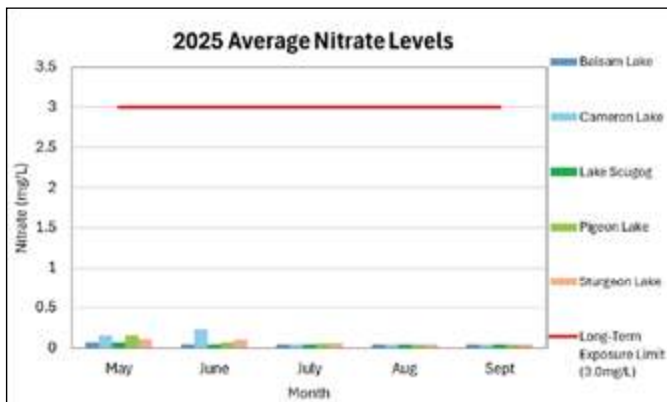
elevated phosphorus loading. These elevated phosphorus levels are often linked to higher inputs of lawn fertilizers, stormwater runoff, and agricultural activities.



Nitrate

Monitoring nitrate in nearshore lake environments is important because these shallow areas receive the greatest influence of land-based runoff, including inputs from agriculture and urban land uses. Increased nitrate levels can also contribute to increased aquatic plant and algal growth and can pose risks to aquatic life.

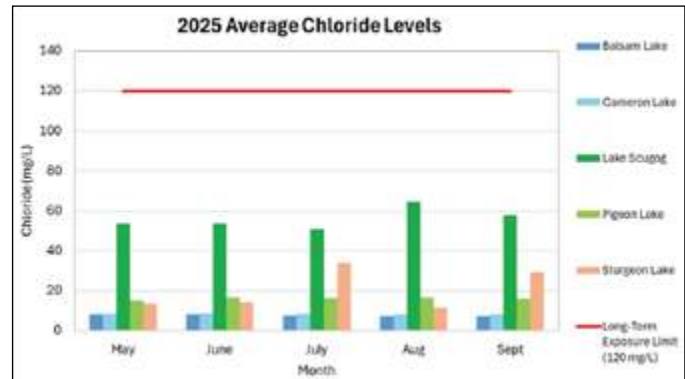
All five lakes remained below the long-term nitrate exposure limit of 3.0 mg/L outlined in the Canadian Water Quality Guidelines for Aquatic Life. Nitrate levels were consistently low throughout the sampling season, with a majority of samples falling below the detection limit of 0.05 mg/L. This is an encouraging result, as maintaining low nitrate concentrations helps reduce the chance of harmful algal blooms, excessive aquatic plant growth, and other negative impacts on aquatic life.



Chloride

Chloride concentrations often rise in shoreline zones where runoff containing road salt enters the lake. These higher chloride levels can place stress on a wide range of aquatic organisms, including invertebrates, fish, and amphibians by interfering with normal salt regulation and reducing survival or reproductive success.

Chloride levels in all five lakes were below the Long-term Exposure Limit of 120 mg/L specified by the Canadian Water Quality Guidelines for Aquatic Life. Lake Scugog consistently showed higher levels of chloride than the other four lakes, likely due to the larger amount of runoff containing salts from urban areas and agricultural land uses which surround Lake Scugog.



Escherichia coli (*E. coli*)

The monitoring of *Escherichia coli* (*E. coli*) in nearshore waters has become a standard in most lake-based water quality monitoring, as it provides a critical indication of fecal contamination. Elevated levels of *E. coli* can signal the presence of harmful pathogens that threaten both human health and aquatic organisms.

E. coli levels across the five lakes are low when compared to the Provincial Water Quality Objectives, with Lake Scugog having the highest average *E. coli* levels. Small amounts of *E. coli* can come from a combination of increased urban and agricultural runoff, higher amounts of wildlife, and aging septic systems. Low concentrations in 2025 are encouraging, as they indicate that there are no significant or persistent sources of fecal contamination entering these lakes that are above Canadian guidelines.

While long-term datasets provide the strongest level of confidence in environmental trends, comparing 2024 results to the 2025 findings can help highlight where conditions are improving and where challenges remain.

With the continued success of the Community Science program, we aim to develop a more comprehensive understanding of nearshore lake health in 2026. We would like to thank our 28 volunteers and lake stewards groups that contributed to the program in 2025.

Community Science - The Power of Volunteers ... cont'd.

Parameter	2025 Findings	What This Tells Us
Total Phosphorus	→ Minimal change in phosphorus across lakes	No significant reductions in phosphorus inputs across lakes. Some locations above Canadian Guidelines.
Nitrate	↓ Lower than 2024 results	Great sign that nitrate inputs were reduced across our lakes. Remains below Canadian Guidelines.
Chloride	→ Similar results to 2024, with reductions in Sturgeon Lake.	Less road salt entering our lakes, and no significant spikes in chloride. Remains below Canadian Guidelines.
<i>E. coli</i>	→ Similar results to 2024.	Indicates no significant <i>E. coli</i> inputs across our lakes, but remains below Canadian Guidelines.
Water Temperature	↓ Lower average and max water temperature across lakes	Suggests less apparent impact from climate change on nearshore water temperatures during the 2025 season compared to 2024.
Conductivity	↓ Lower Average Conductivity across lakes	Less agricultural and road salt inputs into lakes.

Cited Literature

Canadian Council of Ministers of the Environment. (n.d.). Canadian water quality guidelines for the protection of aquatic life. Canadian Council of Ministers of the Environment. <https://ccme.ca/en/summary-table>

Ontario Ministry of Environment and Energy. (1994). Water Management: Policies, Guidelines, Provincial Water Quality Objectives. Toronto, Ontario. Retrieved from <https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives#section-11>

How Everyday Choices Help Protect Pollinators

Catherine Clysedale, White Lake Cottager

A few years ago, my husband and I began our journey into pollinators. We had always been gardeners, but in recent years with more and more information becoming available about the plight of these critical insects, we considered what part we might play in changing the downward spiral. As most of us are aware by now, pollinators are the absolute MVPs of life on Earth – quietly doing work that keeps ecosystems (and our dinner plates) functioning. Over the years we've learned there are little things we can do to make a big impact, from how we deal with fallen leaves, to the types of plants we have in our gardens, to how we handle mosquito control.

Later, as we were preparing to rake the fall leaves at our home in Ottawa, my daughter said, "David Suzuki says 'Don't rake the leaves.'" Being a huge David Suzuki fan, I stopped and said, "Really?" I looked it up, and sure enough, she was right. Trying to convince my husband to leave the leaves was another story. What? Our flower beds, garden, grass, and whole yard have to be neat, orderly, and perfect.

But it didn't take long when we both discovered the leaves weren't just a messy decoration; they're tiny winter homes for bees, butterflies, ladybugs, worms, and even songbirds. They provide shelter, food, and nurseries for creatures that need a safe place to survive the cold months. Leaving the leaves might seem like a tiny act, but it can have a surprisingly big impact. One leaf pile can shelter dozens of insects over the winter. A few fallen leaves and dried-out brush here and there can feed birds, protect hibernating bees, and even improve soil health. Multiply that across thousands of yards, and you start to see how individual choices ripple into collective impact. [1]

Shortly thereafter, we heard an interview on the CBC radio discussing the Ottawa Wildflower Seed Library. This amazing group of volunteers hosts weekly seed giveaways throughout the season. In 2024 they distributed over 100,000 packages of seeds from 265 native species to almost 5,000 community projects, schools, and individuals. When giveaways were finished, they opened up to online orders and mailed seeds for free. [2] We were hooked, and now every January we plant native seeds in containers and place them in snowbanks! I never dreamed they would survive, but sure enough, in the spring, the little shoots started to emerge.



In 2023 I discovered the Natural Edge program. I thought this would be perfect for our cottage on White Lake in the Kawarthas. As they say on their website, "Protect your freshwater by restoring a natural shoreline. Throughout their lifetimes, over 90% of aquatic species use shorelines for food, shelter, breeding, and rearing areas. Protect your shoreline with native plants that are the best adapted to your region in Canada. Native plants help protect your property from erosion, reduce floodwater damage, and improve water quality to enhance your shoreline's resilience against climate change impacts." Wow! I applied for this program immediately, and soon thereafter, I received an email from Kim Ong, Director at Kawartha Lake Stewards Association (KLSA), a delivery partner for the Natural Edge Program. I cannot say enough about this program and the delivery by Kim and her team of volunteers. From the initial visit to design the plan with all native flowers and shrubs, to the ordering, purchasing, and delivering of all the plants and materials, to the enthusiastic volunteers who planted over 130 native plants on a cold and rainy day in October, the Natural Edge program by KLSA was literally a dream come true. On planting day, I saw an otter bouncing up and down in the water beyond our dock and a beaver marching down our property.

My most recent discovery is the negative impact that spraying for mosquitoes has on pollinators. When I attended a webinar on Wildlife Friendly Fall Garden Care, sponsored by the David Suzuki Foundation and presented by Dorte Windmuller (www.pollinatorgarden.ca) I learned what's actually happening when those pesticides are applied:

- Most mosquito and tick control services spray pyrethroids, which are synthetic derivatives of pyrethrins (a naturally occurring insecticide derived from *Chrysanthemum cinerariifolium*).

How Everyday Choices Help ...cont'd.



- Just because it's "natural" doesn't mean it's safe for people, pets, and the environment.

- **Pyrethroids are highly toxic to all insects, including pollinator species.** [3]

- Adult mosquitoes live only about two weeks, and new larvae hatch constantly. This means spraying cannot be a one-time solution – it must be repeated frequently to have any impact. [4] Yet even with repeated applications, the results are disappointing. Why? Because mosquito predators are far more susceptible to pesticides than the mosquitoes themselves. Kill the dragonflies, fish, and other predators that naturally control mosquito populations, and you eliminate nature's built-in solution. [5]

- Bees, butterflies, ladybugs, dragonflies, and thousands of other beneficial insects are killed on contact. The ripple effects include birds who rely on insects as the food source for their babies. When you spray for mosquitoes, you're also eliminating that food source, making it harder for birds to reproduce. [6]

- Because pyrethroids do not break down as quickly in the environment as pyrethrins, repeated spraying can result in accumulation in the environment. [7]

- Contaminated runoff from pyrethroid application near bodies of water poses a significant risk to aquatic species, and the risk is exacerbated by bioaccumulation of pyrethroids in sediment. [7]

- When mosquito and tick control services fog an

area with pesticide, the majority of the pesticide spray goes into the air, creating harmful air pollution that can be inhaled by anyone nearby or downwind, including children or pets who might be playing in a neighbouring yard.

Instead of spraying, I realized there are safe and effective methods that help control mosquitoes that don't have the same negative impacts. The podcast *Best Practices Around Mosquitoes, with Nancy Lawson, May 19, 2025* [8], discusses this and more:

- Mosquitoes breed in standing water. Make sure to remove all sources of standing water. Check trays underneath pots, eavestroughs, empty containers, wheelbarrows—everywhere that water can accumulate. This simple measure goes a long way to preventing mosquito infestations.

- Rinse your birdbath every two to three days.

- If you are going to sit on a patio, put a fan on low. Mosquitoes can't fly in the wind.

- Prepare a bucket trap: Fill a bucket about half or three-quarters full with water. Add a handful or two of straw or dried grass. Let it float and soak. Let it sit a few days to ferment – this smell attracts female mosquitos to lay eggs. Every 3-4 days, dump water onto dry ground, then the eggs never hatch. Repeat.

- Try to avoid being outside an hour before or an hour after sunset.

For those of us who cherish the Kawartha Lakes and in fact, our beautiful planet, this hits home. **Spraying to kill mosquitoes creates long-term ecological and health damage. The healthiest, most mosquito-resistant yard is one that supports pollinators, birds, bees, and all the creatures that rely on our beautiful lakes and land, including humans.**

References

[1] How fall yard maintenance can protect pollinators, October 2023, Greenpeace Canada

[2] Stittsville Central December 2, 2025

[3] Siegfried BD. Comparative toxicity of pyrethroid insecticides to terrestrial and aquatic insects. *Environmental Toxicology and Chemistry*, Volume 12, Issue 9, 1 September 1993, Pages 1683–1689, <https://doi.org/10.1002/etc.5620120917>

[4] U.S. Environmental Protection Agency & CDC. (2020). What you need to know before spraying for mosquitoes. National Wildlife Federation. <https://blog.nwf.org/2020/09/what-you-need-to-know-before-spraying-for-mosquitoes>

[5] Environmental Health. (2003). Field study: New York State mosquito population increased 15 times after 11 years of insecticide spraying. *Journal for Mosquito Control*

[6] National Wildlife Federation. (2025). What you need to know before spraying for mosquitoes. Retrieved from <https://blog.nwf.org/2020/09/what-you-need-to-know-before-spraying-for-mosquitoes>

[7] Li H, Cheng F, Wei Y, Lydy MJ, You J. Global occurrence of pyrethroid insecticides in sediment and the associated toxicological effects on benthic invertebrates: An overview. *J Hazard Mater*. 2017;324(Pt B):258-271. doi:10.1016/j.jhazmat.2016.10.056

[8] The podcast A Way to Garden with Margaret Roach – Best practices around mosquitoes, with Nancy Lawson, May 19, 2025

Managing Invasive Water Soldier in the Trent–Severn Waterway

Robert McGowan, Project Specialist,
Ontario Federation of Anglers and Hunters

Water soldier (*Stratiotes aloides*) is an invasive aquatic plant native to Europe and northwest Asia. It is listed as a priority species for prevention and response by the Council of the Great Lakes Governors and Premiers and is regulated as a prohibited species under Ontario's Invasive Species Act. Managing this plant is critical to protecting the watersheds of the Trent–Severn Waterway (TSW) and the broader Great Lakes basin.

Prior to being regulated, water soldier was sold as an ornamental plant for water gardens, which is believed to be the most likely source of its introduction to the wild. The Ontario Ministry of Natural Resources (MNR) has developed a prevention and response plan that enables individuals and organizations to conduct low-risk monitoring and, in some cases, eradication activities without requiring authorization under the Invasive Species Act. The plan also outlines detailed best management practices for this species.

A Coordinated Response

Water soldier was first discovered in the wild in North America in 2008 within the TSW near the hamlet of Trent Hills. Since then, it has spread downstream and, as of 2021, has been detected in the Bay of Quinte. Additional, unrelated populations have been found in a tributary of Lake Simcoe, Red Horse Lake (north of Gananoque), several private ponds, and most recently in Cook's Bay (Lake Simcoe) in 2024.

Since 2008, management has been led by the Water Soldier Working Group, a collaborative partnership including Parks Canada, the MNR, the Invasive Species Centre, the OFAH Foundation, municipal governments, Indigenous communities, and academic partners. The group employs an integrated management strategy that includes herbicide application, manual removal, monitoring, and public education and outreach.

Management efforts in the TSW began in 2014 and continue today. The Working Group has achieved significant success in reducing plant density in key areas. However, water soldier remains persistent and capable of expanding into new habitats, underscoring the need for continued vigilance and coordinated action.

In 2025, Parks Canada launched the “See It. Pull It.” campaign, inviting members of the public to learn about water soldier and participate in shoreline removal efforts. Engaging waterfront property owners and recreational users is a critical component of long-term management and prevention.

Why Water Soldier Is a Concern

Water soldier spreads aggressively and can significantly disrupt aquatic ecosystems and human uses of waterways.

It forms dense floating mats that restrict water movement and create stagnant conditions (*Figure 1*). These mats crowd out native aquatic plants, reducing biodiversity and weakening ecosystem resilience. By altering water chemistry, water soldier can negatively affect phytoplankton and other organisms that form the base of the aquatic food web.

Heavy infestations also interfere with recreational activities such as boating, fishing, and swimming. The plant's sharp, serrated leaves can cause cuts and injuries, posing a safety risk to swimmers and those handling the plant.

Overall, water soldier threatens ecosystem health, water quality, recreation, and public safety when established.



Figure 1. Dense infestation of water soldier on the Trent–Severn Waterway (McGowan, 2015)

How to Identify Water Soldier

Recognizing water soldier is an important step in preventing its spread. Key identifying features include:

- A submerged aquatic plant that becomes buoyant in summer, forming floating rosettes. In fall, mature

Managing Invasive Water Soldier ... cont'd.



leaves become waterlogged and the plant sinks.

- Bright green, sword-shaped leaves up to 40 cm long with sharp serrated edges.
- Leaves arranged in a circular rosette.
- White flowers with three petals (flowering is rare in Ontario).
- Lightly rooted plants that may also be free-floating.
- Found in water depths of up to 5 metres.
- Production of offsets and turions (vegetative reproductive structures similar to those of a spider plant).

How You Can Help

Learning to identify water soldier and taking steps to prevent its accidental spread on boats, trailers, and fishing equipment are essential to reducing its impact.

- Avoid boating through infested areas where possible.
- Reduce speed when travelling near infestations.
- Always Clean, Drain, and Dry your boat, trailer, and equipment after each use.

- Never buy, sell, transport, or keep water soldier in water gardens or aquariums. It is illegal to import, possess, deposit, release, transport, buy, sell, lease, trade, or grow water soldier in Ontario.

If you find water soldier or another invasive species, report it by:

- Calling the Invading Species Hotline at 1-800-563-7711
- Visiting www.EDDMapS.org
- Searching for the "Invasive Species in Ontario" project on www.inaturalist.org

Public awareness and stewardship play a vital role in protecting our waterways. By working together, we can reduce the spread of water soldier and safeguard the health and recreational value of Ontario's lakes and rivers.

Beth Moore, Pigeon Lake,
AI Purdy Poetry Contest Winner, *Cottage Life Magazine*, Summer 2015.

SEPTIC ABC'S

**Our inground cafeteria
Feeds millions of bacteria.
Though not to everybody's taste
Their favourite food is human waste.**

**But if we flush the wrong things down
Our tiny diners writhe and drown.
So when you flush we ask you please
To follow septic ABC's.**

**No Ammonia, Bleach or Chlorine,
Drain clean, Epsom salts or Fluorine.
Grease and Hair will clog the system,
Microbes die when poisons hit them.**

**Bacteria's anaerobic feat
Is cleaning our waste as they eat.
If we're all careful to flush green,
Their feasts will keep our lake pristine.**

A Quarter of a Century of Conserving and Caring for Nature in the Kawarthas

Kawartha Land Trust celebrates 25 years of conserving and caring for natural and working lands in the Kawarthas and the community that has made it possible.

Dani Couture, Communications Manager,
Kawartha Land Trust



Cattail marsh at KLT's Dance Nature Sanctuary in Selwyn Township. (Photo: Hayden Wilson/KLT)

An anniversary is a moment to pause and recognize time passed - a milestone, a special day, a favourite memory. We carry these moments with us, celebrating them year after year. But what does an anniversary mean for nature?

Five years after Kawartha Land Trust was founded in 2001, and three years after it registered its first Conservation Easement Agreement, KLT received its first land donation – Dance Nature Sanctuary near Young's Point. It's a beautiful place in every season. Evening Grosbeaks flock to its forests in winter. A Fisher calls the forest home. And in the summer, a melody of water-loving birds can be heard from the marsh.

One of the reasons that Dr. Alice Sharpe donated the property was to ensure the marsh – a portion of a Provincially Significant Wetland complex – would be forever protected and cared for - a wetland that supports a wide array of wildlife, including those at risk, sequesters carbon, and contributes to the health of Katchewanooka Lake downstream.

On May 30th of this year, the exact day the donation was finalized 20 years ago, Dance Nature Sanctuary will be in peak spring. The last of the blooming spring ephemerals may be spotted on the forest floor like celebratory confetti. Late spring migrant birds like the Red-eyed Vireo can be heard calling overhead. And the land will be covered in the rich greens we

only dreamed about in the depths of winter.

If you took a photo of Dance Nature Sanctuary twenty years ago and another one from this year, little will have fundamentally changed outside of strategic stewardship work and natural processes unfolding as they do, and that's the point. Generations of wildlife have lived out their lives and will continue to do so in this special place. The trees still purify the air we breathe and the wetlands continue to help improve local water quality.

Kawartha Land Trust has many reasons to celebrate this year. In addition to it being the organization's 25th anniversary and the 20th anniversary of its first donated property, it's also the 10th anniversary of the creation of KLT's Stony Lake Trails network, and



Evening Grosbeaks, an at-risk species in Ontario, at KLT's Dance Nature Sanctuary (Photo: Hayden Wilson/KLT)



KLT's Nogies Creek property. (Photo: KLT)

A Quarter of a Century of Conserving ... cont'd.



View of KLT's Balsam Lake Wetland property (Photo: Lawrie Keillor-Faulkner)



KLT's Balsam Lake Wetland property (Photo: Lawrie Keillor-Faulkner)

the 5th anniversaries of the protection of Balsam Lake Wetland, Jones Woodlot, Morton Nature Sanctuary, and Nogies Creek property.

We're fortunate to be able to celebrate these milestones for nature with the community that made them possible. In the past quarter of a century, thousands of people like you who care about nature and our shared future have contributed to the protection and care of natural and working lands in the Kawarthas. We thank each one of you. Nature thanks you.

As pressures on nature continue in Southern Ontario at large and more locally in our region, the work is far from over. However, as we've seen in the past 25 years, it's a challenge that we can take on together. Every acre protected, every tree planted, every metre of natural shoreline conserved makes a difference. And those are achievements we can celebrate together, both in the moment and year after year.

Kawartha Land Trust is grateful for the support of

community members within Peterborough County, City of Kawartha Lakes, and visitors to the region. We're also thankful for community partners and collaborators like the Kawartha Lake Stewards Association (KLSA) and wish you a wonderful 25th anniversary year and many more. Together, we can strive for a more sustainable future for all.

To learn how you can contribute to future conservation opportunities, upcoming volunteer opportunities, outdoor events, conservation successes, and much more, you can subscribe to KLT's e-newsletter at kawarthalandtrust.org/subscribe.

2024 Kawartha Lakes Wastewater Treatment Plants Report

Mike Dolbey Ph.D., P.Eng., KLSA Volunteer

Each year, KLSA monitors the performance of Wastewater Treatment Plants (WWTPs) that discharge effluent either directly to the Kawartha Lakes or their watershed, or to waterbodies that flow into the Kawartha Lakes. The purpose of WWTPs is to protect public health by minimizing the discharge of pathogens and to protect the environment by minimizing the discharge of phosphorus (P) to our lakes. Of primary interest to KLSA is the quantity of phosphorus that is discharged by these systems to our lakes because phosphorus is known to be the most likely nutrient to cause increases in the growth of aquatic plants and algae.

Lake management studies have shown that the amount of phosphorus now discharged from WWTPs is only a small percentage of the phosphorus entering our lakes from all sources. This was not always the case. Prior to the 1970s, WWTPs discharged between 50 and 100 times more phosphorus than modern WWTPs. However, unlike most other phosphorus sources that are widely distributed, WWTPs are localized sources that can be controlled, and considerable public dollars are spent to build and operate these systems to protect our health and the environment. Municipalities fund WWTPs by charging the users of the systems an annual levy, but they also receive grants from the federal and provincial governments, i.e., all taxpayers, that partly offset the cost of capital projects to repair, upgrade and increase the capacity of WWTPs.

KLSA monitors the performance of WWTPs to determine if they are being operated to their fullest potential. Ideally KLSA would like all WWTPs that discharge directly to our lakes to achieve a 99% phosphorus removal rate. This means that only one part in 100 of the phosphorus entering the plant leaves in the effluent. A drop of removal rate to 95% means five parts in 100 leave the system, which is five times more phosphorus released compared to 99% removal rate. What might seem like a small change in removal rate can have a very large consequence!

As we have indicated in past years, our WWTP data is always one year behind, because the reports for the previous year are not available to us before going to press. This year all the reports were available online on the websites of their respective municipalities.

Again, this year we have included three WWTPs, Minden, Nonquon (Port Perry) and King's Bay, which do not discharge directly into the Kawartha Lakes.

These systems are upstream of our Kawartha Lakes and have at least one body of water in between to attenuate the effects of their effluent discharge. The name of each system used below is that used in their respective reports.

Minden

The Minden Hills Sewage Treatment Plant discharges to the Gull River just above Gull Lake, which is two lakes away from our most upstream Kawartha lake, Shadow Lake. Two bypasses of the tertiary sand filters occurred due to weather events in April and December allowing an estimated 36,199 m³ of partially treated effluent to enter the river. Tertiary treatment consists of two processes. First, aluminum sulphate is added to react with the soluble phosphorus in the effluent changing it to insoluble aluminum phosphates. It also acts as a flocculation agent clumping together the insoluble particles making them easier to filter. Second, sand filters remove the insoluble particulates from the effluent but also have a limited ability to react with residual soluble phosphorus. Bypassing the tertiary sand filters allowed an estimated additional soluble P load of 3.71 kg to enter the river. This increased the total annual P load to **23.9 kg**, considerably lower than last year's 37.7 kg. In 2024 the Minden STP had an effective removal rate of **97.7%**, better than last year's 95.9%. No other spills, bypasses or overflows were reported, and no complaints related to the plant's operation were received during the year.

Average *E. coli* discharges were generally low during the year. The geometric mean of samples during the year ranged from 2.0 to 15.8 cfu/100 mL with an average value of 6.9 cfu/100mL, well within the plant's Certificate of Approval level of 200 cfu/100mL.

Coboconk

The Coboconk Sewage Lagoon System continued to function well in 2024, with planned discharges to the Gull River just above town occurring in April, November and December. The average phosphorus content of all effluent discharges was less than 0.05 mg/L. With lagoon systems such as Coboconk's, the volume of effluent released from the lagoons each year may be considerably more or less than the volume of raw input to the lagoons during the year. This may be due to operational considerations and variable amounts of precipitation and evaporation. Hence, determining the phosphorus removal rate is problematic. Considering all inputs and outputs over the past twelve years, the overall phosphorus removal

rate was **greater than 96.8%** during that period and the 2024 total annual discharge of phosphorus was estimated to be **5.0 kg**.

The geometric mean of *E. coli* in the three discharges during 2024 were 6, 2 and 1 cfu/100mL respectively. No bypasses, spills, overflows or abnormal events were reported during 2024, and no complaints were received during the year.

Fenelon Falls

The Fenelon Falls Water Pollution Control Plant performance numbers in 2024 were very poor for several reasons. While the volume of wastewater treated was almost the same as in the previous year, its reported phosphorus content was about 50% higher than in 2023, and the average phosphorus content of the effluent leaving the plant was 2.4 times higher than in the previous year. Additionally, on five occasions high flow caused by weather events resulted in partial bypasses of the treatment plants tertiary sand filters. The five bypass events resulted in approximately 21.3 kg of phosphorus entering the lake that should have been removed. The annual average removal rate of the plant was 87.5%, much lower than last year's 93.5% and the bypasses reduced the overall removal efficiency to **85.7%**. This resulted in a P discharge to Sturgeon Lake of **145.5 kg** for the year compared to 48.8 kg last year.

In 2024 *E. coli* levels in the effluent from the Fenelon Falls plant were generally low with an annual average geometric mean of 5.6 and a maximum of 12.9 cfu/100mL in July. No complaints about plant operations were received in 2024.

Lindsay

The Lindsay Water Pollution Control Plant is the largest on the lakes. The City of Kawartha Lakes (CKL) owns the Lindsay plant and operated it until the end of July 2015 when its operation was contracted to the Ontario Clean Water Agency (OCWA) which operates all the other wastewater treatment systems owned by CKL. As reported in previous years, the Lindsay plant measures influent and effluent volumes separately with surprisingly different results in past years. In 2024 a new influent measurement system was used which resulted in monthly influent and effluent volumes agreeing within 4.0% throughout the year.

The upgrades to construct a new aeration basin and blower building for the Lindsay plant that were

in progress throughout 2022 were substantially complete by the beginning of 2023. With completion of the upgrades, more stringent limits for Total Suspended Solids (TSS) were implemented. While in 2023 the tighter limits were exceeded four times, in 2024 no TSS exceedances occurred. No bypasses, spills or abnormal discharges from the plant were reported. It is estimated that the 2024 annual average phosphorus removal rate was **98.0%**, better than last year's 96.9%. This resulted in a P discharge to Sturgeon Lake of **235.8 kg**, considerably lower than last year's 346.6 kg.

The annual average geometric mean of *E. coli* in the discharge was 2.4 cfu/100mL with a maximum of 5.2 cfu/100mL in January. In 2024, there were no complaints about operation of the Lindsay plant.

Bobcaygeon

Inflow and infiltration (I&I) in Bobcaygeon's wastewater collection system had been shown to have a significant impact on influent volumes in past years. After CCTV assessment of the whole system in 2022, repairs begun in 2023 were completed in 2024. In 2024 the influent volume was 29% lower than the average influent volume of the past 5 years, attesting to the success of the repairs. Bobcaygeon Water Pollution Control Plant appeared to operate well in 2024 with no reported bypasses, overflows, or abnormal events. One small spill of 2-3 m³ of digester decant occurred but was contained and cleaned up without release to the environment. The average phosphorus removal rate was calculated to be **98.3%**, up from last year's 97.0%. The reported annual phosphorus load to the lake was **65.2 kg**, compared to last year's 77.5 kg.

The annual average geometric mean density of *E. coli* in the discharge was 5.2 cfu/100mL with a maximum of 17.1 cfu/100mL in January. One complaint of odour from the plant occurred during removal of biosolids (sludge) from the plant in June.

Omeme

The Omeme Sewage Lagoons consist of two large settling lagoons. Until 2014 all the effluent was spray-irrigated onto nearby fields during the summer months. A subsurface effluent disposal system was commissioned at the site in March 2014 with the intention that it would dispose of all the effluent. However, there were problems with the capacity of the subsurface system that required both the spray irrigation and subsurface disposal systems be used for a few years. After a study of the problem, changes

2024 Kawartha Lakes Wastewater ... cont'd.

were implemented in 2022. During 2024, the subsurface disposal system was used throughout the year handling 81% of the annual effluent. It was supplemented by the spray irrigation system during the months of September and October to dispose of 19% of the annual effluent.

The average effluent phosphorus concentration in 2024 was 0.44 mg/L, higher than last year's 0.24 mg/L, but well below the allowable 1.0 mg/L. Lagoon systems can have considerable volume buffering capacity with the volume of raw influent and treated effluent varying considerably from year to year. In 2024 the effluent discharged was about 141% of the influent volume. Based on the numbers provided, phosphorus removal was estimated to be ~69% with ~127.0 kg being distributed to the disposal systems. However, because the effluent is disposed of far from Pigeon Lake, removal is probably 100% with respect to our lakes. Two monitoring wells, MW-1 and MW-2, downstream of the subsurface disposal bed and an additional 15 wells between the lagoon system and the lake are monitored by sampling four times a year. Until the end of 2024, all wells have had very low TP levels and there has been no significant change since 2019 when the subsurface disposal system was commissioned. However, in December 2024 and January 2025, the Total Phosphorus (TP) concentration in well MW-1 increased 100-fold from <0.003 mg/L to 0.35 mg/L. Further monitoring will be required.

The annual average geometric mean density of *E. coli* in the effluent was a rather high 232 cfu/100mL this year. This lagoon facility did not require any emergency discharges to the Pigeon River in 2024 and there were no bypasses, overflows or abnormal discharge events reported. One spill of ~1500 m³ occurred in 2024 when a break occurred in a force-main near the lagoons. The spill was contained and about 30 tons of contaminated soil was removed and disposed of at Lindsay Landfill. One complaint was received about odour near the Sturgeon Street Sewage Pumping Station. Air filters were changed and conditions monitored.

King's Bay

The King's Bay Environmental Centre Sewage Works serves a golf course community situated on a peninsula between Lake Scugog and the Nonquon River. Houses down the centre of the peninsula are surrounded by the golf course. Treated effluent from the Works at the apex of the peninsula is discharged into two large disposal beds under the golf course

on each side of the peninsula. One up-gradient and three down-gradient wells are located around each disposal bed to monitor groundwater for phosphorus migration.

The King's Bay Works treats influent using two Rotating Biological Contactor (RBC) units. Both RBCs worked well in 2024. Effluent TP concentration of discharge to the underground disposal beds averaged 0.29 mg/L, similar to the 0.26 mg/L in 2022, well within the allowable 1.0 mg/L. The annual daily loading for 2024 was 0.010 kg per day, about 6% of the allowable discharge of 0.17 kg per day. The annual average phosphorus removal rate within the plant was 99.2% this year. No spills, bypasses or abnormal discharges occurred in 2024, and there were no community complaints.

Monitoring wells located both up and down gradient of the disposal sites have had sporadic high TP readings in past years. In 2016 the TP measurement procedure was changed to collecting a field filtered grab sample from each well twice a year. TP levels in the two upgradient wells have remained low over the past five years. However, a number of downgradient wells have had variably high readings for a few years but with no consistent pattern to the high readings. In 2024, all wells had low readings. The purpose of the monitoring wells is to detect phosphorus migration towards the lake or the Nonquon River. Since these wells are on average 100 m from the lake or the Nonquon River, it is probable that, at least for the time being, there is still effectively 100% removal with respect to the lake.

Port Perry

Port Perry is served by the Nonquon Water Pollution Control Plant (WPCP) which discharges treated effluent into the Nonquon River northwest of Port Perry, which, in turn, empties into Lake Scugog at Seagrave, where the King's Bay facility is located. A new modern plant designed to treat wastewater at an average daily flow rate of 5900 m³/d was commissioned in 2017. In 2024 the system worked well with no operational problems reported.

In 2024, phosphorus was reduced to an annual average of 0.064 mg/L for a total loading of **78.4 kg**, slightly higher than last year's 72.3 kg. This reflects a removal rate of 98.1%, similar to last year's **98.1%**. Monthly Geometric mean *E. coli* levels this year averaged 5.4 cfu/100mL with a maximum of 22 cfu/100mL in April. There were no reported bypasses, spills or abnormal discharges, and no complaints were received during 2024.

2024 Kawartha Lakes Wastewater ... cont'd.

Summary

The total weight of phosphorus discharged to the mainstream Kawartha Lakes from the Lindsay, Fenelon Falls and Bobcaygeon WWTPs in 2024 was 447 kg, less than last year's 470 kg. If we include all the plants that we now monitor, we had total phosphorus loading to the lakes of 554 kg in 2024 compared to 587 kg in 2023. If all plants had achieved the 99% removal rate that we would like, the total phosphorus discharge for the year would have been about 224 kg or about 40% of the 2024 total.

KLSA Annual Review of Area Wastewater Treatment Plant Performance

Plant Location - Discharges to & Type	Year	Phosphorus Removal Rate % (1)	Total Annual TP Load Out kg (2)	Annual TP Load if 99% kg (3)	<i>E. coli</i> (average) (cfu/100mL)	Bypasses, Spills, Comments
Minden - Gull River Extended aeration activated sludge process with tertiary treatment	2017	92.3%	32.9	5.4	297.0	Bypass resulted in ~8.7 kg extra P load
	2018	96.2%	16.6	4.4	82	Bypass resulted in ~0.4 kg extra P load
	2019	95.3%	23.8	5.1	268	Bypass resulted in ~4.2 kg extra P load
	2020	98.1%	11.1	6.0	11.4	Bypass resulted in ~0.2 kg extra P load
	2021	97.5%	18.8	7.4	4.3	Bypass resulted in ~0.4 kg extra P load
	2022	95.2%	32.6	6.8	9.8	Bypass resulted in ~1.7 kg extra P load
	2023	95.9%	37.7	9.1	2.8	Bypass resulted in ~5.2 kg extra P load
2024	97.7%	23.9	10.6	6.9	Bypass resulted in ~3.7 kg extra P load	
Coboconk - Gull River Mill Pond Dual lagoons semiannual discharge to river	2017	>97.3%	5.1	1.1	2.7	None reported
	2018	>97.0%	4.0	1.2	1.6	Overflow of 50m ³ - no P load to Gull R
	2019	>96.9%	5.0	1.1	12.2	None reported
	2020	>96.9%	2.8	1.0	1.6	None reported
	2021	>97.9%	2.7	1.1	6.7	None reported
	2022	>96.4%	2.7	1.1	6.8	None reported
	2023	>96.8%	6.1	1.2	84.6	Spill of 1m ³ - no P load to Gull R
2024	>96.8%	5.0	1.4	3.0	None reported	
Fenelon Falls - Sturgeon Lake Extended aeration activated sludge process with tertiary treatment	2017	94.6%	49.1	9.1	2.3	Bypass resulted in ~ 1.6 kg extra P load
	2018	95.8%	34.0	8.0	2.2	Bypass resulted in ~ 1.5 kg extra P load
	2019	95.7%	33.7	7.7	9.0	None reported
	2020	93.9%	39.6	6.4	2.5	Bypass resulted in ~ 3.5 kg extra P load
	2021	97.5%	55.5	20.0	7.5	Bypass resulted in ~ 3.0 kg extra P load
	2022	92.3%	84.4	10.9	4.2	Bypass & Overflow ~2.1 kg extra P load
	2023	93.2%	48.8	7.2	2.3	Bypass & Overflow ~2.4 kg extra P load
2024	85.7%	145.5	10.2	5.6	Bypass resulted in ~ 21.3 kg extra P load	
Lindsay - Sturgeon Lake Flow equalization lagoons; extended aeration activated sludge process with Actiflo tertiary treatment	2017	97.5%	311.7	125.9	11.0	Overflow resulted in ~0.5 kg extra P load
	2018	97.4%	301.1	115.4	14.0	Overflow resulted in ~0.1 kg extra P load
	2019	97.2%	364.7	132.8	11.2	None reported
	2020	97.7%	307.4	131.2	4.0	None reported
	2021	95.2%	754.7	158.4	259.2	None reported
	2022	97.1%	318.6	111.3	9.8	None reported
	2023	96.9%	346.6	110.5	3.9	None reported
2024	98.0%	235.8	120.0	2.4	None reported	
Bobcaygeon - Pigeon Lake Extended aeration activated sludge process with tertiary treatment	2017	94.7%	114.7	19.7	53.7	None reported
	2018	93.0%	171.3	24.4	98.8	None reported
	2019	96.7%	65.5	19.8	4.9	None reported
	2020	97.8%	37.9	16.9	2.8	Spill of 1 m ³ reported
	2021	96.3%	64.2	17.5	6.8	None reported
	2022	97.2%	61.3	22.1	8.3	None reported
	2023	97.0%	77.5	25.5	9.7	None reported
2024	98.3%	65.2	39.8	5.2	Spill of 3 m ³ reported	
Omeme - Fields/Underground Dual lagoons with spray irrigation; pumped into underground disposal beds beginning 2015	2017	100.0%	0	0.0	150	None reported
	2018	100.0%	0	0.0	172	None reported
	2019	100.0%	0	0.0	132	None reported
	2020	100.0%	0	0.0	190	None reported
	2021	100.0%	0	0.0	3496	None reported
	2022	100.0%	0	0.0	856	None reported
	2023	100.0%	0	0.0	1070	Spill of 38 litres. No P load to Pigeon Lake
2024	100.0%	0	0.0	232	Spill 1500 litres. No P load to Pigeon Lake	
King's Bay - Underground Pumped into underground disposal beds.	2017	100.0%	0	0.0	-	None reported
	2018	100.0%	0	0.0	-	None reported
	2019	100.0%	0	0.0	-	None reported
	2020	100.0%	0	0.0	-	None reported
	2021	100.0%	0	0.0	-	None reported
	2022	100.0%	0	0.0	-	None reported
	2023	100.0%	0	0.0	-	None reported
2024	100.0%	0	0.0	-	None reported	
Port Perry - Lake Scugog Extended aeration activated sludge process with tertiary treatment; effluent discharge to Nonquon River.	2017	98.8%	52.3	45.3	2	None reported
	2018	99.0%	44.5	44.4	2	None reported
	2019	98.7%	52.0	40.9	1	None reported
	2020	97.9%	86.3	41.0	2	None reported
	2021	98.8%	49.8	39.9	21.5	None reported
	2022	98.6%	56.2	39.1	3.3	None reported
	2023	98.1%	72.3	38.3	9.0	None reported
2024	98.1%	78.4	42.0	5.4	None reported	

- (1) 'Phosphorus Removal Rate %' is the percentage of the phosphorus in the plant influent that is removed before effluent is discharged.
- (2) 'Total Annual TP Load Out kg' is the total weight of phosphorus, in kilograms, that is discharged from the plant during the year.
- (3) 'Annual TP Load if 99% kg' is the total weight of phosphorus, in kilograms, that would be discharged from the plant during the year if the plant achieved a 99% Phosphorus Removal Rate.

The Future of Canada's Freshwater

Watersheds Canada

Since 2002, Watersheds Canada has grown from a local lake association to a nationally recognized charitable organization, continually adapting its programs to protect and restore Canada's lakes, rivers, and shorelines. The organization's head office is based in Central-Eastern Ontario, where a small team of eight staff members develop and pilot each program. Once field-tested and refined by the local communities who deliver them, all programs and resources are packaged and shared with groups across Canada. The organization's growth over the past two decades would not have been possible without the support of hundreds of community-level partners like waterfront and cottage associations, Indigenous communities, municipalities, public libraries, schools, and fish and game clubs.

Through past projects, Watersheds Canada has established a strong presence in the Kawartha Lakes region and remains committed to ongoing work there, supported in part by our Executive Director, who resides in Douro-Dummer Township. Programs have been delivered in partnership with Kawartha Lake Stewards Association and other local groups to support shoreline naturalization projects on lakes such as Pigeon Lake, Buckhorn Lake and Stoney Lake. Additional initiatives have included training volunteers to deliver the Love Your Lake program on Clear Lake, and constructing and naturalizing wetlands in Douro-Dummer Township and Otonabee Township.

Stoney Lake was also chosen as the location for our first ever Wine & Water fundraising event, providing a meaningful opportunity for community members to connect while supporting Watersheds Canada. Our work in the region is ongoing, with the Nature Discovery Program expanding to Asphodel-Norwood Public Library and TRACKS Youth Program in Summer 2026. We are working hard on a new training opportunity that will significantly increase the ability of local residents and groups to restore local fish habitat. The growing need to locally deliver Watersheds Canada's action-based programs reflects the many pressures facing lakes, rivers, and shorelines throughout the Kawartha Lakes area.

Climate Trend Impacts on Freshwater Health

Risks to lake health and biodiversity identified by both residents of the Trent-Severn Waterway and the Kawartha Lake Stewards Association align with



Training KLSA interns

the changes Watersheds Canada is seeing nationally in our lakes and rivers. A large proportion of Canada's freshwater is found within the Great Lakes Basin, encompassing the Trent-Severn Waterway and Watersheds Canada's backyard in Central-Eastern Ontario. Over the past 30 years, water temperature in the Great Lakes Basin has increased by 0.43°C each decade and is expected to trend further upwards (ECCC, 2025). This warming trend is of particular concern for Canadians as the greatest warming of water bodies will be observed at higher latitudes. Our lakes are warming twice as fast as all other lakes globally; the Great Lakes Basin alone has warmed 0.4°C more than lower latitude water bodies in the Northern Hemisphere (NASA, 2015; Environmental Law & Policy Center, 2025; Weber, 2022).

Watersheds Canada has observed this climate trend in many visible, on-the-ground ways. For example, in Central-Eastern Ontario there has been an increasing abundance of algal blooms in lakes and rivers. The combination of warmer water temperatures and increasing phosphorus and nitrogen in lakes is feeding the development of cyanobacteria. Though a naturally occurring organism, in large quantities, cyanobacteria can create inadequate oxygen (hypoxic) conditions which threaten aquatic life. Watersheds Canada staff, researchers, and partner groups have observed a connection between the increased presence of developed shorelines and the development of algal blooms due to increasing runoff and nutrient input to our freshwater systems.

Another observed climate trend is Ontario's changing water cycle. As a province defined by its natural

The Future of Canada's Freshwater ... cont'd.

freshwater systems, much of Ontario's identity has been shaped by our aquatic environments. Though we depend on these systems for our businesses, leisure, food production, cultural and historical connections, and overall survival, over time there has been an increasing variability in precipitation patterns in Ontario. While the total annual precipitation may not decline, longer dry periods between rainfall events and increased evaporation during summers reduce water availability (Mortsch et al., 2015). Earlier snowmelt also contributes to lower summer baseflows in rivers and streams, as well as dry, hot summers which are vulnerable to devastating forest fires.

Ontario's rivers and lakes are the cornerstone of many of our most vital ecosystems but as variable precipitation patterns become more common, it is essential that we are equipped to navigate the issues these problems present. Watersheds Canada is set to soon release a new Waterfront Climate Resiliency Tool through its flagship shoreline planting program, The Natural Edge. This tool will facilitate much-needed nature-based solutions for shoreline property owners and municipalities so they have the greatest ability to cope with, adapt to, and recover from the impacts of climate change being experienced locally and regionally. Be sure to sign-up for Watersheds Canada's e-newsletter to be the first to hear when this tool is released and available to property owners: <https://watersheds.ca/newsletter-sign-up/>

Changes in Shoreline Living

The current climate crisis comes at a time when the number of people pursuing waterfront living and recreation is on the rise. Working across Canada on a vast number of lakes and rivers, Watersheds Canada's staff and delivery partners have assessed 55,000 shorelines across 244 developed lakes. These assessments showed that only 22% of properties met the minimum criteria for sustaining wildlife and lake health. This highlights the disconnect between people's values and their actions. There are more homes being built on newly developed lots, and many existing smaller properties are being redeveloped into multi-story homes. These redeveloped homes, while still having the original small footprint, are increasing the demands on lake systems. This can lead to pressures such as greater use and development of septic systems nearshore, causing problematic excess nutrient input into our lakes and rivers and further feeding the algal bloom trend.



Volunteers work to restore shoreline



Lower lying areas

There is a connection between the development of residences and the recreational use of the land, but not always in a sustainable way. There appears to be a lack of understanding and knowledge of the importance of shoreline vegetation and the services it provides to our lakes and rivers. Development has not only increased in terms of residences but also in other ways right to the water's edge. Some waterfront residents 'clean' their shorelines by removing vegetation and woody debris, mow right to the water's edge, install human-made erosion control structures, or add beaches where the substrate is not native. Others use harmful chemical pesticides and road salts, or reduce the natural ground permeability

The Future of Canada's Freshwater ... cont'd.

of their properties through paving. In these ways, we are taking Ontario's freshwater for granted, altering the natural state of the landscape for our sole benefit. This mindset does not acknowledge the impacts to the vast lake biodiversity, and ultimately ourselves, within our lakes and rivers.

These pressures underscore the importance of restoration and education programs that elicit community involvement. At Watersheds Canada, we are optimistic for the future of Kawartha Lakes and Canada's freshwater and believe that with evolving partnerships with critical local-level partners like the Kawartha Lake Stewards Association, the Federation of Ontario Cottagers' Associations, U-Links, and the Birchcliff Property Owners Association, we will be able to work together to protect and restore our lakes and rivers through the continual development and delivery of resilient solutions and programs.

Through shoreline plantings, fish habitat restoration, municipal policy work, children and youth education programs, and more, Watersheds Canada is equipping communities across the country to protect their lakes, rivers, wetlands, and shorelines. You can

support this critical work by making a tax-receiptable donation today: <https://watersheds.ca/donate>

Sources

Environment and Climate Change Canada (ECCC) and the U.S. National Oceanic and Atmospheric Administration. (2024). Annual Climate Trends and Impacts Summary for the Great Lakes Basin. 2025.

Environmental Law & Policy Centre. (2025). 2025 Update: An Assessment of the Impacts of Climate Change on the Great Lakes by Scientists and Experts from Universities and Institutions in the Great Lakes Region. Internet: <https://elpc.org/resources/the-impacts-of-climate-change-on-the-great-lakes/>

Mortsch, L., Cohen, S., & Koshida, G. (2015). Climate and water availability indicators in Canada: Challenges and a way forward. Part II—Historic trends. Canadian Water Resources Journal/Revue canadienne des ressources hydriques, 40(2), 146-159.

National Aeronautics and Space Administration (NASA) (2015). "Study Shows Climate Change Rapidly Warming World's Lakes." NASA. Internet: <https://www.nasa.gov/news-release/study-shows-climate-change-rapidly-warming-worlds-lakes/>

Weber, B. (2022). "Research survey finds Canadian lakes in increasingly hot water over climate change". City News. Internet: <https://halifax.citynews.ca/2022/07/19/research-survey-finds-canadian-lakes-in-increasingly-hot-water-over-climate-change-5598688/>



Photo contest entry: Patriotic Owl, Stony Lake. *Photo by: Janie Kelly*

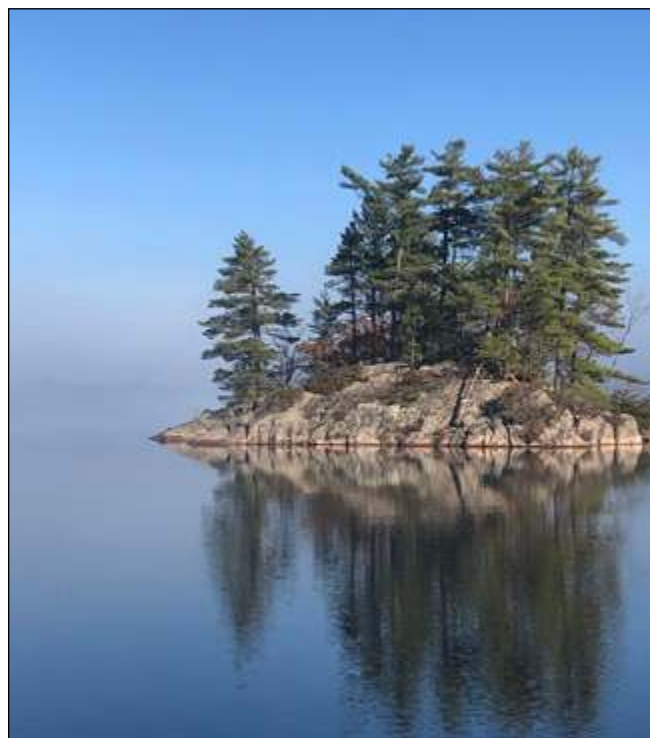


Photo contest entry: Peaceful island. *Photo by: Janice Foster*

Changes and Challenges: An Environment Council for Clear, Stoney and White Lakes Retrospective

Lois Wallace, Communications Coordinator, and **Roz Moore**, Chair, *Environment Council for Clear, Stoney and White Lakes*.

In today's disrupted and fast-changing world, our cottage lakes provide more of a refuge and rejuvenation spot than ever. Yet our lakes have been changing too, and the pace of this change is accelerating.

With its predecessor organizations dating back to 1998, the volunteer, non-profit Environment Council has been in a perfect position to observe these changes and continues to adapt its priorities to address them.

Not surprisingly, the 2008 Clear, Stoney and White Lake Plan report, *A Delicate Balance*, (<https://www.environmentcouncil.ca/who-we-are>) identified lake water quality as the top concern for lake residents and stakeholders. The Plan's recommendations on water quality, aquatic plants, natural heritage features, wetlands, wildlife habitat, and land use – along with new data – continue to guide Environment Council (EC) work.

Today, despite the many initiatives undertaken by EC and its regional partner organizations, several factors contributing to poorer lake water quality continue to accelerate.

How our lakes are changing

Perhaps the most noticeable changing factor is the residential character of the lakes. The lake population is turning over generationally. Compounded by an increase in new owners and year-round residents, traditional cottages are also being torn down to be replaced with larger homes, and develop-

ment has been pushed into shallower areas.

A tragic impact is the removal of trees and other native vegetation and the hardening of shorelines as some owners and their designers bring 'show-place' landscaping to the lakes. This increases over-nutrication from phosphorus and nitrogen runoff, causes shoreline erosion, and damages fish and wildlife habitat.

Waterfront owners are increasingly frustrated by the rapid growth of invasive aquatic plants and algae, especially starry stonewort, which detracts from recreation. An increase in larger, faster boats, and careless boating and fishing practices introduce and spread both animal and vegetative invasive species, and contribute to erosion. Our water is getting warmer, accelerating the growth of aquatic plants and algae and potentially harming fish.

On the land, we see increasing impacts of climate change, such as extensive loss of trees due to severe storms, heat, drought, and insect pests. Along with human activities, changing climatic conditions may also be contributing to the spread of invasive plants like phragmites and dog-strangling vine.

Another unwelcome change affecting our lakes is the maze of recent provincial planning and municipal affairs legislation. To give just a few examples, Bill 185 amended the Planning Act and Municipal Act, and the Provincial Planning Statement replaced two previous planning policies. The Conservation Authorities Act has been changed more than once, and the Province plans to reduce the number of authorities from 36 to seven. This reduces critical protections for natural areas, constrains the roles and resources of municipalities and conservation authorities, and severely limits the ability of individuals and environmental organizations to participate in approval processes for potentially damaging developments.

Now some positive news

Against this challenging background, the Environment Council continues to focus on its long-term goal: *To preserve and enhance the sustainability of the local watershed environment for future generations of humans and wildlife.*

Since 2008, we've undertaken many ambitious projects, often in partnership with other local environmental organizations and with government



Volunteers help landowner replace trees. *Photo credit: Kim Ong*

Changes and Challenges ... cont'd.

and foundation funding. Here are some of our major accomplishments:

- Initiated evaluation of 900 hectares of wetlands, resulting in their designation as Provincially Significant Wetlands;
- Participated in the *Kawarthas Naturally Connected: Natural Heritage System* study and mapping project;
- With Kawartha Land Trust (KLT) and Fleming College, mapped the mainland shore of Clear and Stoney Lakes, identifying natural and altered areas to help target conservation, stewardship, and restoration programs;
- In a joint project with Camp Kawartha, restored two sections of the Camp's shoreline with more than 1500 native plants, reducing erosion and providing a shoreline education demonstration site;
- Assisted KLSA in delivering the Watersheds Canada *Natural Edge* shoreline planting program to 20 private shorelines on our three lakes;
- Monitored dissolved oxygen and water temperatures over six seasons, with guidance and data analysis by Ministry of the Environment, Conservation and Parks;
- Launched a Shoreline Conservation Initiative to focus shoreline protection advocacy with residents and surrounding Townships. This has broadened to become a second initiative, Shoreline Conservation: Peterborough County, with whom we partner. Collectively we have delivered a dozen deputations to five Townships, urging them to provide stronger protection for their shorelines, and made at least 20 presentations to ratepayer and lake associations.

Looking to the future

With input from our members and lake associations, we have updated our *Action Plan and Strategies* for 2026.

This plan prioritizes Healthy Shorelands, as we continue advocacy with the Townships and education of residents and other users of the lakes. We're promoting participation in the *Natural Edge* planting program and the KLT/EC ecological survey program for private shorelands.

We're educating lake residents about healthy and sustainable septic system practices and how these reduce harmful nutrients and bacteria in the lakes. Furthermore, we're increasing our efforts to raise awareness about best practices for managing inva-

sive aquatic and terrestrial species.

As we push forward on these and other initiatives, we're further strengthening our productive partnerships with the above-mentioned organizations and others.

We're giving special attention to our local lake associations, encouraging and assisting them to develop environmental protection plans of their own, as one association has already done. And, as requested, we're providing them with issue-based messages to guide their members to take positive actions. Social media is being used to extend the reach of these messages beyond association membership.

There are hopeful signs that more of the lake community is recognizing the ever-urgent need to protect lake health.

Some lake associations are looking at how they could 'rebrand' the purpose of their associations to foster a stronger sense of environmental responsibility while engaging new, younger member families. And 'shoreline fashion' is gradually changing for the better. Increasing numbers of owners are taking advantage of the *Natural Edge* planting program and KLT/EC ecology conservation program, and spreading positive messages and a little peer pressure to their neighbours.

The demanding work of protecting lake health can appear daunting, but fresh volunteers and energy are always needed. Therefore, it's worth reminding ourselves of what our lakes might be like today if like-minded individuals and organizations, including ourselves, had not accomplished all that we have over the last 25 years.

Please visit our website: www.environmentcouncil.ca



Native plant expert Christina Renrich leading an EC Talk & Tour. Photo credit: Susie Young-Moore

The Scugog Lake Stewards' Time to Reflect

Barbara Karthein, Director Science and Research
Rob Messervey, President



The Kawartha Lake Stewards and the Scugog Lake Stewards are sister stewardship organizations sharing and celebrating a similar beginning date 25 years ago. We also share the goal of protecting our waters in the face of

pressing lake and watershed issues. The Scugog Lake Stewards were pleased to have been invited to share a look back at some of our work and our accomplishments over that time through this publication.

We, like the KLSA, have witnessed the effects of increasing development or redevelopment around our shorelines and feeder streams, which add silt and contaminants and decrease habitat for both native flora and fauna. Climate change has generally increased our water temperatures and decreased our ice-in times. New invasive species have arrived, with a range of negative effects on lake water quality. Those impacts, while out of our control to some degree, have been the impetus behind our effort to do what we can for the health of our lake, which is one of the headwater lakes for the Trent-Severn Waterway.

Despite challenges at times in sustaining necessary funding and the ebbs and flows of our volunteer base, our Board and members are proud of our accomplishments in undertaking restorative projects, conducting major research projects, and maintaining a robust monitoring program.

Projects

It is a challenge to summarize the many projects we have carried out over the years. In our early years, we built two shoreline parks in Port Perry (photo at right) to demonstrate seven different shoreline erosion protection methods as well as planting a natural shoreline featuring all native plants, shrubs, and trees with a fully accessible walking trail. We continue to work on enhancing the stormwater component from many urban areas of Port Perry. Additionally, we take part in a wide number of regional and municipal committees. One that we are especially proud of is that, while working with the Region on the design of the new Port Perry Wastewater Treatment Plant, we insisted upon and got high-quality treatment of nitrogen as well as phos-

phorus.

This year, we are proceeding with a lake carrying capacity study for our warm water, very developed lake. We are also working with Kawartha Conserva-



Millennium Trail built by Lake Stewards to prevent erosion

The Scugog Lake Stewards' Time to Reflect ... cont'd.

tion on the installation of three new fishing shoals.

Research

Since the beginning of our organization, we have conducted many different forms of research. Notably in 2016, we proceeded with a large 3-year water quality study funded by the Trillium Foundation with the Kirkwood Lab of Ontario Tech University (OTU). Following that, we have continued to do a lot of follow-up research with OTU on starry stonewort, nearshore water quality, and continued studies with the Lake Simcoe Regional Conservation Authority on lake plants and algae and the impact of increasing salt in our nearshore waters. Many research papers have published our work (see www.scugoglakestewards.com/research/).

Our Communications, Education, and Constant Awareness

We all need to be leaders in communicating with, educating, and informing our communities about our lakes and their watersheds. On this we must certainly laud the Kawartha Lake Stewards team for their yearly, very professional, Annual Lake Water Quality Reports and booklets, which form an extensive digital and hand-out ready library.

The Scugog Lake Stewards have always taken a multi-faceted program approach to our work. While our restoration projects and science, research, and monitoring gain a lot of attention, our focus on communications, although not as dramatic, is what has made the biggest difference in community awareness and involvement. It is something of which we can be truly proud. When we first began interacting with the public in a big way, there was incorrect information about the health of the lake, the 'weeds,' the carp die-off, toxic blue-green algae blooms, flooding, low water, the fishery, shoreline erosion protection and naturalization, the operation of the dam at Lindsay, and even whether the lake flowed south or north! Now we hear misinformed comments less and less. This is what we consider a real win!

How have we been getting the word out? We work on a story-by-story, presentation-by-presentation, partnership-by-partnership, meeting-by-meeting, basis to educate our community about how watersheds work and how to care for the lake we love, which we know is the foundation of our Scugog economy. We post interesting, informative information almost every day on eight different local



Dr. Kirkwood, OTU, presenting at a recent Science Social.

social media bulletins. We hold four Science Socials every year, inviting our members, local council, and the public, covering science topics such as phragmites control, climate change, septic system health, algae, and why we need to care about our lake, ... to mention a few. Our approach is slow and steady.

Input to Local and Provincial Planning and Policy Issues

We continue to make comments on issues that will impact our lake, such as the provincial government's proposal on Conservation Authority regionalization, large scale contaminated fill importation, development intensification (Accessory Dwelling Units), potential harmful-to-the-lake development applications (such as the Avenu Properties, a 600-unit Minister's Zoning Order based proposal on the shores of Cawker's Creek), and municipal waterfront plans.

Partnerships and Engagement

Finally, what could we do without our many partnerships and contacts over the years? We actively engage with and learn from our many partners such as KLSA, Kawartha Conservation, Lake Simcoe Region Conservation Authority, the Mississaugas of Scugog Island First Nation, OTU, York and other universities, North Durham Nature, and many more.

Together with the Kawartha Lake Stewards, we perform vital services throughout the Kawartha Lakes.

NORKLA: Fostering Connections and Lake Health

Doug Wellman, NORKLA President

The North Kawartha Lakes Association (NORKLA) was founded in the 1980s and was originally known as the Burleigh Anstruther Cottagers' Association (BACA). Following the amalgamation of the Townships of Burleigh, Anstruther, and Chandos, and the creation of the Township of North Kawartha, the organization evolved into what is now NORKLA. This transition reflected a broader mandate to represent lake and cottage communities across the entire Township.

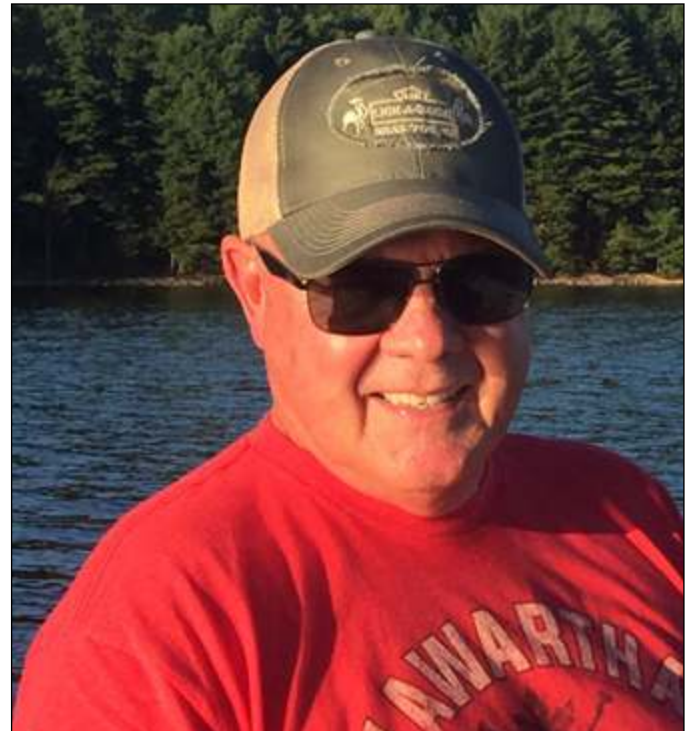
NORKLA's purpose is threefold:

- To provide a forum for sharing concerns, issues, knowledge, and expertise related to cottaging and lakefront living.
- To promote the protection, sustainability, and long-term health of our lakes.
- To advocate for and protect the rights and interests of its member associations and their residents.

Membership in NORKLA is open to established Cottage and Cottage Road Associations that are located within, or partially within, the Township of North Kawartha. Currently, NORKLA represents 25 member associations, collectively giving a strong and unified voice to lake communities throughout the region.

NORKLA acts as an important liaison between its members and a wide range of municipal, regional, provincial, and environmental organizations. These include local Townships, Peterborough County, the Province of Ontario, the Trent-Severn Waterway (TSW), Parks Canada, and numerous environmental and advocacy groups such as the Coalition of Equitable Water Flow (CEWF), Watersheds Canada, the Federation of Ontario Cottagers' Associations (FOCA), the Muskoka Watershed Council, Friends of the Muskoka Watershed, and the Coalition of Haliburton Property Owners Association. Through these relationships, NORKLA facilitates the exchange of information, coordinates advocacy efforts, and ensures that issues affecting lake communities are communicated effectively to decision-makers.

Each year, NORKLA organizes two key events for its member associations. The June meeting features presentations by experts on topics of current interest and importance to the lake community, including environmental issues, regulatory changes, and



Doug Wellman, NORKLA

emerging challenges. The August meeting focuses on member engagement, with Lake Stewards from each association reporting on summer activities, observations, and concerns, followed by an open exchange of challenges, solutions, and best practices.

In 2015, NORKLA partnered with the Dr. Paul Frost Laboratory at Trent University to undertake Advanced Water Testing on member lakes. This comprehensive scientific program includes extensive testing throughout the entire water column, with particular emphasis on cold-water Lake Trout lakes. Parameters tested include dissolved oxygen, water temperature, phosphorus, calcium, chloride, carbon, chlorophyll, nitrogen, and other key indicators of lake health. For the past ten years, graduate students have conducted this testing annually in August, building a valuable long-term data set that allows NORKLA and its partners to identify trends, detect early warning signs, and respond proactively to emerging issues. This work is especially critical as climate change continues to affect water temperatures, oxygen levels, and overall lake ecosystems. To date, results have remained stable, indicating generally healthy lake conditions.

NORKLA members are also actively involved with the Environment Council for Clear, Ston(e)y, and White

NORKLA: Fostering Connections ... cont'd.

Lakes in support of a Peterborough County Shoreline Conservation initiative. Over the past four years, members of this group have made presentations to local councils, emphasizing the importance of natural shorelines and their role in maintaining lake health, biodiversity, and water quality.

NORKLA works closely with the Kawartha Lake Stewards Association (KLSA), jointly monitoring and reporting on lake health throughout the Kawarthas. The association also shares data, experiences, and best practices with Watersheds Canada, Friends of the Muskoka Watershed, the Muskoka Watershed Council, the Coalition of Haliburton Property Owners Association, and the Lake Partner Program.

Ongoing challenges include educating property

owners about the importance of maintaining natural shorelines, avoiding the use of lawn fertilizers, and ensuring properly maintained septic systems. NORKLA continues to advocate for the reinstatement of regular septic inspection programs by local townships. Invasive species such as Eurasian Milfoil and Starry Stonewort remain significant concerns; however, education and responsible shoreline and property management play a key role in mitigating these threats.

NORKLA's website, www.norkla.ca, provides a wide range of resources and links designed to educate property owners and visitors about cottage life, lake stewardship, and best practices for protecting and preserving lake health for future generations.



Photo contest entries: *(Above)* Morning sunrise before winter storm, Big Bald Lake. *Photo by: Pam Dickey.* *(Right)* Curious bandits, Stoney Lake. *Photo by: Janice Foster.*



A New Way to Care for the Lakes We Love

Jessica Livingstone, KLSA Director

Lakes are more than beautiful scenic backdrops, they are living systems that shape community life, support local economies, and contribute to our personal wellbeing. Across Ontario, however, these beloved waters are under growing pressures from residential development, increased boating activity, erosion, invasive species, and declining water quality. Responding to these challenges takes more than awareness alone. It requires a shared approach that turns concern into action. That's where The Land Between's Blue Lakes Program comes in.

The Blue Lakes Program is a voluntary eco-label that draws on behaviour-change science to support effective, long-term lake stewardship by lake communities. Designed to empower both individuals and groups, the program brings together education, engagement, and data to help communities protect the lakes they call home. Participants work toward shared goals across key Improvement Areas, such as habitat restoration, invasive species management, education, social outreach, and reconciliation, creating a clear framework for collaboration and collective responsibility.

Over the course of a year, progress toward these goals is tracked and celebrated. Communities that meet their objectives are awarded the Blue Lakes Flag, a symbol of shared commitment and ongoing care for the lake they love. More than a recognition, the seal reflects a community-wide effort to align everyday actions with long-term conservation outcomes.

At the heart of the program are two complementary tools. The Blue Lakes Activity Hub (BLAH!) offers engaging education and participation opportunities, from interactive learning resources to hands-on stewardship activities that make conservation actions accessible, practical, and rewarding. Alongside it, the Blue Lakes database, the largest lake-health database in Ontario, provides a powerful foundation for informed decision-making. Together, these tools help track changes in lake health, document community action, and support timely, confident responses to emerging environmental pressures.

Joining the Blue Lakes Program delivers benefits on three interconnected levels:

For the lake, the program helps cultivate a strong

culture of care, where stewardship becomes a shared community value rather than an individual task. Increased participation strengthens ecosystem health and function, while growing datasets improve the ability to detect changes early and guide effective management decisions. In fact, we already have multiple lake associations around the Kawartha Lakes region that are interested in participating in the Blue Lakes Program and have begun the process!

For properties, healthy lakeshores offer more than ecological resilience. Lake-friendly practices help prevent erosion and flooding, reduce environmental and safety risks, and protect the long-term value of waterfront properties. In many cases, these improvements also contribute to lower insurance risk, and more beautiful stable shorelines.

For individuals, the benefits are deeply personal. Participation fosters a sense of connection to neighbours, to place, and to nature itself. Research consistently shows that stronger connections to nature support enhanced mental and physical wellbeing, and the Blue Lakes Program offers meaningful ways to learn, engage, and feel part of something larger.

Protecting lakes is not only a shared responsibility, but a shared opportunity. By joining the Blue Lakes Program, communities and individuals can take informed, collective action to protect the waters they love, both today and for generations to come. To learn more or become part of the program, visit www.bluelakes.ca or email jessbluelakes@thelandbetween.ca and start your Blue Lakes journey today!



Early morning on Stocking Lake, Haliburton. *Photo by: Jessica Livingstone.*

More 25th Anniversary Photo Contest Submissions



Trumpeter Swans. *Photo by: Heather Bell.*



Marina Misty Morning, Port Perry. *Photo by: Diane Reddy.*

More 25th Anniversary Photo Contest Submissions



Winter Dusting, Port Perry. *Photo by: Diane Reddy.*

"Our Mission is to conduct research in areas of concern, support activities that improve lake health, and educate the public about the importance of protecting the Kawartha Lakes."



Cloud Reflections. *Photo by: Patricia Phillips.*



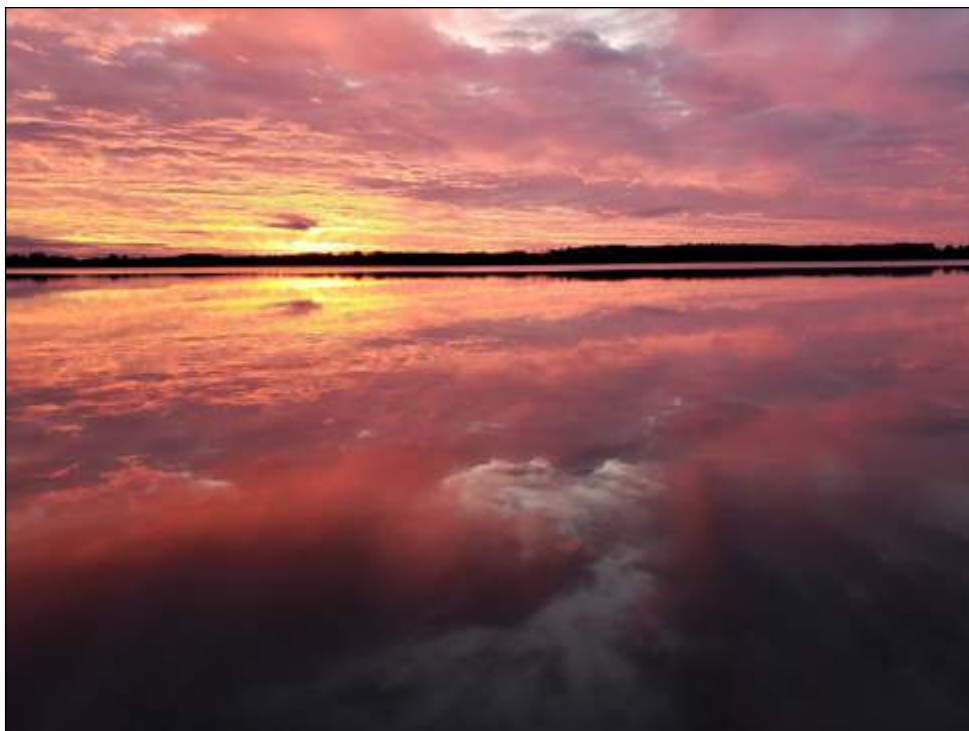
Winter Sunset, Scugog. *Photo by: Heather Bell.*

More 25th Anniversary Photo Contest Submissions



Glorious Fall Sunset. *Photo by: J.P. Braband.*

"Join us in our mission to safeguard this precious environment—together, we can make a lasting impact on the health of our beloved lakes."



Sunset, Lake Scugog. *Photo by: J.P. Braband.*

More 25th Anniversary Photo Contest Submissions



Peaceful Fishing. *Photo by: Patricia Phillips*



Kayak and cloud reflections. *Photo by: Sandra Morrison*



Appendix A - Board of Directors

2025 – 2026 Board of Directors



Ed Leerdam
Chair/Treasurer
Nogies Creek



Robert Bailey
Vice-Chair
Lower Buckhorn Lake



Sheila Gordon-Dillane
Secretary
Pigeon Lake



Heather Alley
Director
Pigeon Lake



Jessica Livingstone
Director
Peterborough



Kimberly Ong
Director
Stony Lake



Brett Tregunno
Director
Omeme



Jeff Blodgett
Director
Clear Lake

KLSA Privacy Policy

The complete KLSA Privacy Policy is on the KLSA website: www.klsa.ca.

KLSA collects information about our members and volunteers such as name, address, telephone number, email address and preferred method of communication. Information may be kept in written form or electronically. It is used to provide information about KLSA activities and related lake water issues of interest to residents of the Kawartha Lakes. Information will not be disclosed to anyone else unless required to do so by law and will be deleted when it is no longer required. Mailing lists will not be sold, transferred or traded. Information will be kept in a secure place. Further details can be obtained by contacting the KLSA Privacy Officer by email at klsa@klsa.info or by regular mail at 264 Bass Lake Road, Trent Lakes ON K0M 1A0.

Thank You to Our 2025 Supporters

FOUNDATIONS AND MUNICIPALITIES

Gold (\$5,000+)

Silver (\$1,000 - \$4,999)

*Township of Douro-Dummer
Municipality of Trent Lakes
Kawartha Conservation Authority*

Bronze (less than \$1,000)

Municipality of Selwyn

ASSOCIATIONS/BUSINESSES/INDIVIDUALS

Platinum (\$1000+)

Gold (\$200 - \$999)

Ann and John Ambler
Sheila Gordon-Dillane and Jim Dillane
Dr. Michael Dolbey
Alyson Driedger
Janet and Paul Duval
Carol Ingleton
Mary and Jim Keyser
Penny and Bob Little
Patti and Tom McAllister
Edward (Ted) Oakes
Paris Marine
Peterborough Pollinators
Pinewood Cottages and Trailer Park
Rosedale Marina
Janet Hasslett-Theall and Larry Theall
Cathy and Jeff Webb

Silver (\$100 - \$199)

Chris Appleton
Birch Bend Cottage Resort

Silver (\$100 - \$199), cont'd.

Birchcliff Property Owners Association
Camp Kawartha
Egan Marine Houseboat Rentals
Elaine Gold
Gill Fisher and Bob Woosnam
Lakefield Foodland
Audrey and Thomas McCarron
Rosemary and Claudio Rosada
Heather and Dr. Hans Stelzer
Helen Westlake
Edith and Joe Wood

Bronze (less than \$100)

Anonymous X 6
Mary Auld
Big Bald Lake Cottagers Association
Big Cedar Lake Stewardship Association
Buckhorn Sands Property Owners Assoc.
East Beehive Community Association
Yvonne Flavelle
Carol and David MacLellan
Daniel McMurdy
North Kawartha Lakes Association (NORLKA)

Appendix C - Treasurer's Report and Financial Statements

KLSA Treasurer's Report as of December 31, 2025

Ed Leerdam, KLSA Treasurer

This Treasurer's Report refers to the 2025 calendar year and the H & R Block Statement of Financial Position summarizing Revenue, Expenditures and Assets for 2024 and 2025 Fiscal Years. Our thanks to Mr. Chad Irvine of H & R Block for preparing these Financial Statements.

As noted in last year's report, in 2024 KLSA was fortunate to win 2 grants: one from Environment & Climate Change Canada (ECCC), the other from Canadian Wildlife Federation (CWF) totalling \$57,379. We did make use of most of those monies, and some of those financials (plus and minus) carried over into 2025.

As we did last year, in order to see year-to-year-to-year comparisons (apples to apples), we will exclude these 2024 grants and carryovers into 2025 as much as possible from this analysis. The 2 grants (from ECCC and CWF) totalled \$57,379 in 2024, and CWF granted us a further \$2,000 in 2025. In 2025 we had to give back to ECCC an unspent amount of \$4,902. As part of the work these grants were for, we paid Watersheds Canada \$5,938 in 2024 and \$5,000 in 2025 for their part of the project. Removing these amounts from this analysis we then arrive at Revenues for 2024 at \$24,666, and 2025 at \$22,788. It's quite difficult to extract all the items related to the work these grants are for, so for this analysis we'll remove the \$4,902 returned to ECCC in 2025, and the easily identifiable items which are the Watersheds Canada invoices: \$5,938 in 2024 and \$5,000 in 2025. So then Expenses for 2024 become \$59,208, and \$17,690 in 2025. The total 2024 Expenses still remain much higher than normal due to the work done and paid under the grants. All this applies to the Natural Edge Program only.

Contributions and Donations are down 16.83% at -\$1,229 year-over-year. Donations from businesses were significantly up: \$765 (111.68%) while donations from Individuals and Associations were down significantly: -\$799 (-16.44%), and \$1,195 (-67.90%) respectively.

Grants from Municipalities were up \$841 (42.33%) year-over-year.

Our continuing sources of income were:

• <i>E. coli</i> Testing Fees	\$4,425 ¹
• Municipal Grants	\$2,828
• Individual Donations	\$4,060
• Private business Donations	\$1,450
• Association Donations	\$ 565
• Advertising in the KLSA annual LWQR	\$6,550
• Interest from GICs (reserve funds)	\$ 905

Recurring operating expenses included:

• <i>E. coli</i> Lab Test Fees	\$3,856
• Liability Insurance	\$1,927
• KLSA Annual Water Quality Report	\$4,870
• Public Meetings	\$1,428 ²
• Office	\$ 896
• Website	\$ 692
• Memberships	\$ 209
• Professional Fees	\$ 396
• Bank Charges	\$ 76

We closed 2025 with a cash position of \$14,336, and \$20,000 reserves in GICs.

¹ \$540 test fees for 2024 was received in 2025.

² Includes \$945 for new projector and pointer for meetings.

Kawartha Lake Stewards Association

(unaudited- See Notice to Reader)

Financial Statements

December 31, 2025

Appendix C - Treasurer's Report and Financial Statements ... cont'd.

Notice to Reader

I have compiled the Statement of Financial Position of the Kawartha Lake Stewards Association as at Dec 31, 2025 and the Statement of Operations and Changes in Net Assets for the year then ended from information provided by management

I have not audited, reviewed or otherwise attempted to verify the accuracy or completeness of such information. Accordingly, readers are cautioned that these statements may not be appropriate for their uses

Chad R. Irvine

Haliburton, Ontario

January 9, 2026

Appendix C - Treasurer's Report and Financial Statements ... cont'd.

Kawartha Lake Stewards Association Statement of Financial Position As At December 31, 2025

	2025	2024
Assets		
Cash	34368	37170
Prepaid Expenses		
	<u>34368</u>	<u>37170</u>
Liabilities		
Accounts Payable and Accrued	395	395
Net Assets	<u>33971</u>	<u>36775</u>
	<u>34336</u>	<u>37170</u>

Prepared Without Audit- See Notice to Reader

Appendix C - Treasurer's Report and Financial Statements ... cont'd.

Kawartha Lake Stewards Association Statement of Operations and Changes in Net Assets Year Ended December 31, 2025

	2025	2024
Revenues		
Contributions and Donation		
Private	4060	4859
Businesses	1450	685
Associations	565	1760
Water Testing Fees	4425	4050
Advertising	6550	6300
ECCC Grant		54379
Kawartha Conservation Authority	4005	
CWF Grant		3000
User Fees		4225
Interest Earned	905	800
Municipal Grants	2828	1987
	<u>24788</u>	<u>82045</u>
Expenditures		
Annual Report Costs	4870	4991
Water Testing Fees	3856	4321
Meeting Costs	1428	545
Professional Fees	396	387
Website	692	620
Natural Edge- Special Project	7340	40172
Aquatic Plant Guide- Special Project		6893
Grant to Kawartha Conservation- Joint Project	5902	3945
Memberships	209	175
Insurance	1927	1947
Office and Administration	896	1085
Bank Charges	76	85
	<u>27592</u>	<u>65146</u>
Excess of Revenues over Expenditures	-2804	16899
Net Assets, Beginning of Year	<u>36775</u>	<u>20271</u>
Net Assets, End of Year	<u><u>33971</u></u>	<u><u>37170</u></u>

Prepared Without Audit- See Notice to Reader

Appendix D - Thank You to Our 2025 Volunteers

Without our volunteers, whether serving on our Board, leading a program, scooping water or aquatic plants out of our lakes, planting native shrubs along shorelines or attaching a temperature monitor on docks, KLSA would not exist and would not be able to do the work and collect the data that is so important knowing how good (or not) the waters are in our lakes. We are very grateful to all our volunteers who help in all these ways and more.

(We strive to ensure no-one is missed when we acknowledge our volunteers. If you see we have missed you or we've made a mistake, please let us know.)

Heather Alley	Tyler Harrington	Diane Northey
Chris Appleton	Bruce Hooey	Kimberly Ong
Bob Bailey	Jeanine Ignatz	Christine Pigeon
Jeffrey Blodgett	Sherri Ireland	Line Pinard
Amanda Brazeau	Shanna James	Mark Potter
George Brown	Trish Jamieson	Kathy Price
Jeffrey Chalmers	Peter Johnston	Liam Price
Carol Cole	Bill Kelcey	Dave Samson
Rich Corbin	Wendy Kennedy	Sarah Scarborough
Lillian Crane	Janet Klein	Jen Schimmens
Mark Crane	Cindy Lee	Aaron Shafer
Kal Cryderman	Kari Lee	Chad Smith
Jim Dillane	Ed Leerdam	Caroline Stickelbroek
Mike Dolbey	Jessica Livingstone	Diane Trauzzi
Warren Dunlop	Patty MacDonald	Ralph Trauzzi
Douglas Erlandson	Tom McAllister	Brett Tregunno
Julia Finlay	Dean Michael	Roland van Oostveen
Theresa Francis	Jacqui Milne	Cathy Webb
Jessie Gordon	Kaleigh Mooney	Grace Widuch
Sheila Gordon-Dillane	Brian Moore	Phelisha Williams
Jill Hamilton	Roslyn Moore	Beth Woodcock
Guy Hanchet	Bill Napier	Bob Woosnam

Support the Kawartha Lake Stewards Association

Please Support the Kawartha Lake Stewards Association

KLSA distributes all its publications, including this one, at no charge. We need your continued support to be able to provide these annual reports to cottage associations, libraries, government agencies, academics, and to people like you. If you have benefited from this report and would like to see this work continue, please consider a donation. Completely run by volunteers, KLSA provides excellent value for every dollar it receives and gratefully acknowledges every donor in our annual report. Please give generously.

Please send an e-transfer to: klsa@klsa.info

Please include in the comments your name, your Association or Business name (if donation is from one of these), full address, email address, your lake, if you would like us to mail you our next annual Lake Water Quality Report, and if you would like us NOT to publish your name or business in KLSA publications.

To send a cheque, please fill out this form and mail to:

KLSA Treasurer, 264 Bass Lake Road, Trent Lakes, ON K0M 1A0

To enquire about advertising in this report, please email klsa@klsa.info.

KLSA Donation Form

I am proud to support KLSA's work at the level of:

- Gold - \$200 and up
- Silver - \$100 - \$199
- Bronze - less than \$100

Donation Amount \$ _____



If sending a cheque, please make it payable to: Kawartha Lake Stewards Association.

Please note that KLSA cannot issue charitable donation receipts for personal income tax purposes.

Name: _____

Name of association or business if applicable:

Exact name to appear in KLSA publications. A business receipt will be issued.

Address: _____

City: _____ Postal Code: _____

Email: _____

My Lake: _____

- Please mail the next annual KLSA Lake Water Quality report to me at the above address.
- Please do not publish my name or business name in KLSA publications.



Kawartha Lake Stewards Association

We are looking for new Board Members!

Do you love your favourite Kawartha Lake? Are you interested in ensuring that all Kawartha Lakes stay healthy for future generations to enjoy? Do you have or want to learn skills in the following areas?

- **fund-raising • financial management • communication**
- **proposal-writing • volunteer engagement**
- **community science and education**

KLSA is led by a volunteer Board of Directors. The Board is responsible for planning and implementing KLSA programs and for governance and financial management of the organization. By making a relatively modest time commitment, our Board members really make a difference! If you want to learn more, please contact klsa@klsa.info and a member of the KLSA Board of Directors will contact you.



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KLSA Spring Meeting!

Saturday May 23rd, 2026

9:30am to 12:30pm

Buckhorn Community Centre
1782 Lakehurst Road, Buckhorn

GUEST SPEAKER: Warren Dunlop, Senior Aquatic Ecologist (Retired) Ontario Ministry of Natural Resources, President North Pigeon Lake Association (NPLA), and avid ornithologist

TOPIC: Observing the 'Wings' of Change: Bird Populations in the Kawarthas

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- ❖ *E.Coli* testers: kits available for pick up



Kawartha Lake Stewards Association

www.klsa.ca

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KawarthaConservation.com/StateoftheLakes

Call for Volunteers

Interested in keeping our Kawartha Lakes healthy?

KLSA is looking for new Board members, so consider applying today!

Stay in touch with the Kawartha Lake Stewards!

www.klsa.ca

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