

## SUMMER 2017 NEWSLETTER

### A Word from the Chair

It has been a successful year for the Muskrat Watershed Council. We started the year by participating in the Heritage Radio Holly Jolly Radiothon. A big thank you to everyone who participated and/or donated! Another successful fundraising event that happened recently was Swim for the Lake where Sarah Hall swam the full length of Muskrat Lake, beginning at the bottom of Meath Hill on Muskrat River – a total of 16.5 km. Incredible.

In winter/spring 2017, our efforts focused on preparing to take part in the Love Your Lake program with Watersheds Canada. Algonquin College's Environmental Technician Program and Office of Applied Research and Innovation were crucial in helping execute the Love Your Lake program this summer. A great team of students – Paul Cipriani, Alexa Mantifel, and Brady Beaupre – as well as Environmental Technician Martyna Tomczynski and our crew of dedicated volunteers spent many summer days on Muskrat Lake assessing approximately 330 properties. That's a lot of lakefront!! Muskrat Lake property owners can look forward to their own personal (and confidential) assessment, available spring 2018.

The Ministry of Environment and Climate Change (MOECC) water quality monitoring network continued to be managed and sampled by Algonquin College for its fourth consecutive year. This fall, Muskrat Watershed Council will be releasing the 2015, 2016, and 2017 water quality reports written by Dr. Rebecca Dalton. These will provide more information on the state of the watershed over a period of 4-years. It is important to have a picture of the watershed that spans several years, in order to understand short-term vs. long-term impacts. It is important to note that these reports would not be possible without the consistent sampling done by Algonquin College students. At the same time, the controlled tile drainage sites continue to be monitored – more on this in the newsletter.

We are working on installing an aeration system at Cobden Beach if permitting allows. If approved, installation could happen this fall. Muskrat Watershed Council members are also attending grant writing classes and water quality conferences in order to better serve their communities. We encourage you to become a member or volunteer on a project – just let us know!

All in all, this has been a busy and productive year, and your support means a lot!

We thank you.

Sincerely,

Karen Coulas

Chairperson, Muskrat Watershed Council

Dairy Farmer



**Karen Coulas, Chair**

# Collaboration – The Essence of Community

Collaboration: a purposeful relationship in which all parties strategically choose to cooperate in order to achieve shared or overlapping objectives.

Based on this definition, it is easy to think of collaboration as a natural tendency for humans and even for non-human animals, as it is beneficial to our survival. In nature, we observe non-human animals working together all the time toward a common goal, which is the proliferation of their “community”. This is where the idea of symbiotic relationships emerge.

And so it goes for our human communities. We do not live in a vacuum where each community works independently of one another. Community boundaries are fluid and, especially in this globalized day-and-age, smaller communities must work together to compete with ever expanding global markets and urban economies.

We are all facing pressures: federal and provincial governments, municipalities, community organizations, healthcare, schools, etc. In fact, when did our communities and the various groups forming them not face pressures? Maybe in the post-WWII era when the economy boomed ... but with a boom comes a bust ... and an echo.

Folks, we are in a time of echo. We sometimes hold on to the past – a past where funding was easy to get or resources were plentiful. We need to work with what we have and do the best we can. We can certainly talk about what grinds our gears, strive for better, and fight for change. These are essential aspects for change. However, we also need to keep moving forward on making small changes everyday. We need to stay positive.

And we must not forget that collaboration, or the symbiotic relationships that can lead us toward healthier communities, can also work toward our detriment if we do not nurture these relationships. We must understand that differing opinions are healthy and expected – it is whether we can accept our differences and still work together toward the greater goals of protecting our watershed and fostering a thriving community.

Never was there a time where communities or groups did not collaborate to get things done. We are social beings after all. The Muskrat Watershed Council has heard its fair share of criticism and appreciation. This is how we learn, grow, share, and bring about change as an organization and as a community.

The number of amazing relationships and collaborations formed over the last 5 years is truly astounding. Without these relationships, whether through the sharing of information, knowledge, and/or resources (e.g., equipment, funds, volunteers, etc.), we would still be talking about the problem and not doing anything to solve it. And trust us, everyone is doing a heck of a lot!

This article is a huge THANK YOU to our community – Renfrew County and beyond – for their support and interest in positive collaboration. This following list is not exhaustive, but offers an idea of the level and layers of collaboration.

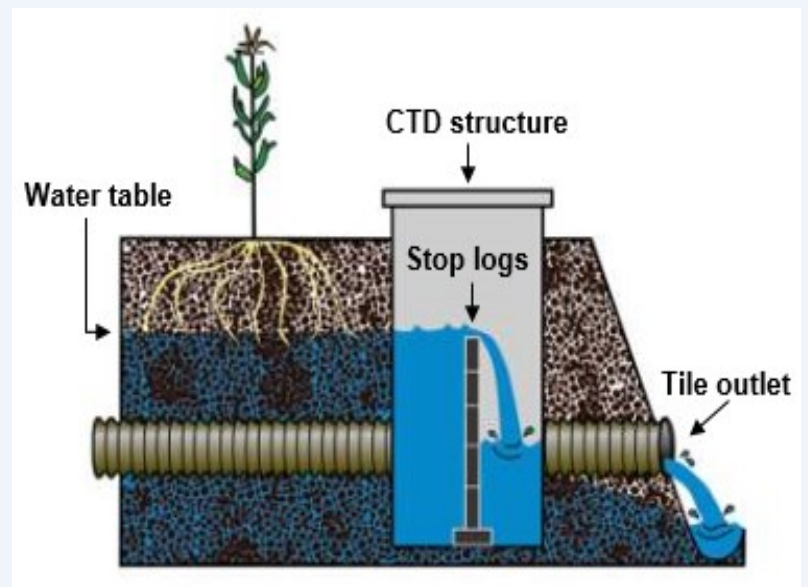
Muskrat Watershed Council members, Algonquin College (faculty and students), Township of Whitewater Region, Township of Laurentian Valley, Township of Admaston-Bromley, Jp2g Consultants, SRB Technology, Ministry of Environment and Climate Change, Ministry of Natural Resources and Forestry, Ontario Ministry of Food, Agriculture, and Rural Affairs, Agriculture and Agri-Food Canada, Farm & Food Care Ontario, Canadian Nuclear Laboratories, Deep River Science Academy, Renfrew County Health Unit, National Research Council Canada, Carleton University, Laurentian University, McGill University, Algonquins of Pikwakanagan, Watersheds Canada, Canadian Wildlife Federation, Ottawa Riverkeeper, Ottawa River Institute, Bonnechere River Watershed Project, Water Management Systems, Muskrat Lake Association, Scientists, Local Farmers, Cottagers, Residents of Cobden, Event Attendees, Local Business Owners, Donors, Concerned Citizens ...

Julie Sylvestre

Director, Science & Water Quality Committee, Muskrat Watershed Council

# Monitoring the Effectiveness of Controlled Tile Drainage in Renfrew County

In 2016, we saw the installation of controlled tile drain (CTD) structures on three properties in the Township of Admaston/Bromley, which was the result of partnerships between the Muskrat Watershed Council, Algonquin College, local farmers, and Agriculture and Agri-Food Canada. These projects were funded by the Ministry of Environment and Climate Change's Great Lakes Guardian Community Fund (GLGCF), awarded to the Muskrat Watershed Council, as well as the Ontario Ministry of Agriculture, Food and Rural Affairs Best Management Practices Verification and Demonstration Fund (BMPVD), awarded to Algonquin College's Office of Applied Research.



Function of a CTD structure

Controlled tile drainage uses a dam-like structure installed on the main header of an agricultural tile drain system to hold back nutrients and water, adjusting the water table height and increasing water availability to roots in the growing season. In the winter and spring, the dam-like components, known as stop logs, are open to allow water to drain and flow freely from the field and closed in the summer to hold water back during dryer weather.

For the purpose of monitoring and research, we chose a property suitable for more extensive monitoring, which is known as our research/monitoring field. Extensive monitoring allows us to understand whether CTDs are suitable for improving some of the water quality issues in the Muskrat Lake Watershed. It also allows us to discern whether CTD offers a benefit to the farmer.

Two CTD structures were installed on two-thirds of the research/monitoring field, which currently grows corn, leaving one third of the field uncontrolled. This scenario helps determine CTD effectiveness by drawing comparisons of the controlled vs. uncontrolled field sections.

The CTD structures are each fitted with an automated water sampler that collect samples during heavy rainfall events. One automated sampler has a Bubbler Flow Meter, a technology that continuously releases an air bubble at a set height of 2.67 feet from the bottom of the CTD structure. This Bubbler Flow Meter can detect water level based on the pressure acting against the bubble it releases to the surface through the water. The automated sampler is set to collect a sample only when water is above the 2.67 feet mark and when the level changes 1 cm in a 24-hr period (known as a "flow condition" typically occurring after a heavy rainfall).

The other automated sampler uses a HOBO Water Level Logger to determine the height of the water in the CTD structure, and is set to collect a sample 3 times per day on Wednesdays and Sundays. The HOBO Water Level Logger is placed on the inside of the CTD structure at a known depth of 2 inches above the bottom of the CTD structure, recording atmospheric pressure and temperature. We are able to download this information (data) from the HOBO Water Level Logger using a software that calculates the difference in pressure between the logger that is in the structure (ambient pressure) and a logger tied to a tree on site (atmospheric pressure) to determine the water level in the CTD structure.

When a sample is collected from one of the CTD structures in flow condition, a sample is also collected from the tile drain outlet responsible for draining the uncontrolled portion of the field to compare differences in phosphorus and nitrogen levels between the controlled and uncontrolled field sections. These samples are tested for total phosphorus, soluble phosphorus, ammoniacal nitrogen, nitrate, total kjeldahl nitrogen, total suspended solids and pH.

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A weather station is located on a portion of the research field and is controlled by one of the CTD structures. The weather station includes an anemometer, which records wind speed and direction, as well as a rain gauge recording precipitation. It also uses an air temperature probe and an underground soil probe that measures volumetric water content, temperature and electrical conductivity. Another station across the field (on the uncontrolled portion) has an additional soil moisture probe for comparing moisture, conductivity and temperature, as well as water retention and movement between the controlled and uncontrolled sections of the field.

This summer, additional research on the research/monitoring field with Algonquin College and the National Research Council (NRC) looks to determine the effectiveness of CTD at increasing the productivity of corn (biomass). We are collecting monthly measurements of corn height across 18 plots to record average height over the growing season, in conjunction with aerial images produced by a multi-spectral camera fixed on an aircraft flown by researchers from the NRC.

Corn samples are collected, weighed, dried and weighed again to determine biomass through wet weight vs. dry weight. We plot the differences in productivity on a map. This will assist in the creation of 3-D imagery of the field and help to compare the productivity of the uncontrolled vs. controlled fields through the observation of spectral signature emittance rates of corn captured in the imagery. A spectral signature is the amount of wavelengths absorbed, transmitted and reflected by the corn. This project will help determine whether remote sensing is effective in determining biomass estimates. Understanding changes in biomass (positive or negative) helps us understand CTD benefits for the farmer.

Martyna Tomczynski

Environmental Technician, Algonquin College Waterfront Campus

## Swim for the Lake – A Big Accomplishment for a Small Community

There are different ways we can express our concern and dedication towards a cause. We can be a scientist, an advocate, a politician, a teacher. We can choose to change our behaviour. We can also choose to push our bodies to the limit through a feat of athleticism. Remember Terry Fox? Of course you do. We all do. Doing something that challenges our physiology is one of the oldest symbolic expressions for showing how much we care about something.

On June 17, 2017, Sarah Hall swam a great distance – the length of Muskrat Lake and some of Muskrat River – a total of 16.5 km to show her dedication towards a local cause. Her friend, Jeff White, also swam a portion of the lake.



**Sarah Hall completing her swim**

Sarah and Jeff began their swim at roughly 7:30 a.m. at the bottom of Meath Hill on Muskrat River. This was Jeff's first time at attempting a swim of this nature. Given the length of the swim, both swimmers were required to have kayak support. The kayakers would offer the swimmers water and very small portions of food during the swim. The kayaks also worked as a compass for the swimmers, since swimming in open waters can be quite disorienting, especially when conditions are choppy.

Mid-swim, Jeff switched with his kayaker to take a break, but continued his swim later on. In total, Jeff swam approximately 12-km, a huge feat in itself! Sarah never stopped, except to drink water or eat mashed up peanut butter and bananas, all the time treading water. Winds were high mid-swim and the water was choppy. Sarah pushed through and even found the energy to laugh with her fellow kayaker, Julie Sylvestre.

By the end of the swim, at 6 hours and 16.5 km, Sarah still managed to arrive with a smile and a big cheer. Sarah's swim helped raise awareness and her dedication to the Muskrat Watershed Council and the health of the lake will surely be remembered.

A big thank you to Sarah, Jeff, and all of our supporters on behalf of MWC!

# That's a Wrap! A Successful Summer for the Love Your Lake Shoreline Assessment for Muskrat Lake

The Love Your Lake program administered by Watersheds Canada and the Canadian Wildlife Federation teamed up this summer with Algonquin College's Waterfront Campus and Muskrat Watershed Council to survey properties on Muskrat Lake. Three summer students: Alexa Mantifel (Queen's University), Brady Beaupre (Algonquin College), and Paul Cipriani (Algonquin College), as well as Environmental Technician Martyna Tomczynski, participated in the program by surveying all 330-some properties over a two week period. Muskrat Lake property owners Andy Laird and Dave Thomassin took the team by boat to conduct the shoreline assessments.

Now that the data is collected, students are inputting the information into the Love Your Lake database. This will generate a lake health report for each property owner, including a personalized and confidential assessment report of their property, available by spring 2018. These reports will provide helpful suggestions and information on the state of each shoreline property as well as recommendations on how to build and/or maintain a healthy shoreline.

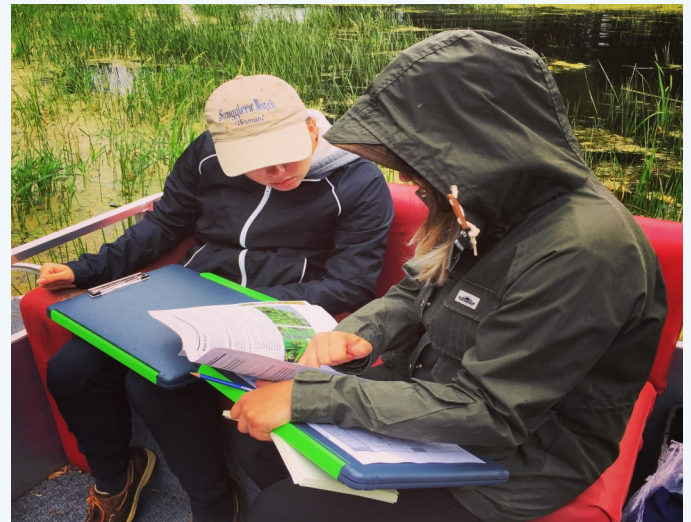
Having a healthy shoreline is important; shorelines provide food and shelter for wildlife, protect against erosion and act as natural filtration systems. Part of having a healthy shoreline is including a good buffer between your property and the water. A buffer is a permanent portion of the shoreline that can include a wide variety of native shrubs, grasses, and trees – these can be aesthetically pleasing, raising property value and even attracting more butterflies and birds. Native vegetation is important, as they tend to handle climates that are more robust and are usually more appealing to native wildlife. Vegetation will also reduce erosion by securing the soil with a strong root system, and can uptake nutrients from water runoff. Other factors that make a healthy shoreline include keeping a portion of your shoreline “au naturel” - wildlife habitat features like fallen logs, dead standing trees, and overhanging trees, are all great for maintaining ecosystem health.

The Love Your Lake program shoreline assessment for Muskrat Lake was certainly a success! We would like to thank everyone for their support and cooperation. If you live on the lake, please stay tuned for your personalized and confidential report coming spring 2018.

For more information, please visit [www.loveyourlake.ca](http://www.loveyourlake.ca).

Alexa Mantifel

Love Your Lake Program Summer Student 2017



**Alexa Mantifel (left) and Martyna Tomczynski (right) referencing an aquatic species identification guide**





## A Day in the Field with Algonquin College Students



Watching the installation of a CTD structure



Measuring water velocity



Filling out Ministry of Environment and Climate Change bottles for water quality sampling



Measuring pH on Mink Creek



Measuring corn height for biomass research



Winter water quality sampling



Installing a water level gauge



Sampling rain or shine!



Measuring dissolved oxygen on the Snake River



## A Day in the Field with Algonquin College Students (continued)



Sampling from a culvert using an extended grab sampler



Ready to record a vertical profile of Muskrat Lake using a YSI Sonde



Downloading data from the weather station



Sampling off of Highway 41



On the boat with MWC Director of Tourism and Recreation, Andy Laird



Enjoying a day in the sun with a water level logger



CTD Monitoring Setup



Installing a soil monitoring probe



Showing off a recently installed CTD structure



*Healthy land, water and quality of life for future generations on the  
Muskrat Lake Watershed*

*Muskrat Watershed Council*



**The Muskrat Watershed Council would  
like to thank all those who have donated  
over the years!**

## **Contact Us!**

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