

How Can We Improve Canada's Fresh Water?
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According to NASA (2017), out of all the water in world (including oceans, rivers, and lakes) only three percent of it is freshwater. However, freshwater is vital for all living things. It provides water that we can drink, powers agriculture, and is what makes civilization on this Earth possible. Canada holds about one fifth of the world's freshwater and it's home to thousands of rivers, lakes, and wetlands (NASA). However, many of these lakes are currently in danger because of harmful human activity. In fact, Lake Winnipeg has recently been named "world's most threatened lake" by the Global Nature Fund (2013) due to the toxic algae that is poisoning the lake. Fortunately, organizations such as The Lake Winnipeg Foundation are dedicated to the health and wellbeing of the lake, and are coming up with many solutions to the issues facing Lake Winnipeg.

Lake Winnipeg's watershed is the second largest watershed in Canada. According to the Water Stewardship Division (2017) from the Government of Manitoba, the drainage basin extends nearly 1,000,000 km² across the country and stretches over four provinces and four US states. Several major rivers (including the Red, Winnipeg, and Saskatchewan rivers) flow into and feed this massive lake. Only one river flows out of Lake Winnipeg (the Nelson River) and its outflow is used for hydroelectric power generation. Lake Winnipeg has been very important to millions of people, especially for the Icelandic people in 1875. According to Neil Babaluk (2010) in his article "Historic Hecla", Lake Winnipeg's shores became home to a group of Icelanders who were forced out of their homes because of a volcanic eruption. Lake Winnipeg provided a place for these people to live, who also used the lake's resources to create a thriving fishing community. Nowadays, around seven million people depend on the important resources that Lake Winnipeg provides, which includes drinking water, hydroelectricity, and food. This means that if it were to become too damaged for humans to use, millions of people would be left without an adequate supply of these basic human needs. Unfortunately, this could become a reality because recent studies are showing that a process called eutrophication is already causing harmful effects to the health of the lake.

The water quality in Lake Winnipeg has been deteriorating rapidly as a result of the harmful human activity. Eutrophication, which occurs when there is an excessive amount of nutrient build up in the lake, is the main concern when it comes to the health of Lake Winnipeg. Although algae and other plants need nutrients such as phosphorus and nitrogen in order to grow, humans tend to produce an excessive amount of these nutrients through agriculture, the use of fertilizer, and the production of cattle. In addition to the overuse of nutrients, humans have also been destroying wetlands, which are an essential part of the Earth's filtration system. The vegetation in these wetlands filter out nutrients from the water that would otherwise end up in Lake Winnipeg. According to the Lake Winnipeg Foundation, 75% of Manitoba's wetlands have already been drained because of the spike in the industrial development. All of these human activities are seriously damaging Lake Winnipeg and are leading to harmful changes in its ecosystem.

According to researchers at Environment Canada, the excess of nutrients that have built up in Lake Winnipeg is causing algae to grow very rapidly, producing algal blooms. Although algae grows naturally in the lake, the nutrient buildup is causing blue-green algae to form in massive numbers, which can destroy the freshwater ecosystem. The researchers state that when the algae dies it decays and uses up dissolved oxygen in the water, depriving many plant and animal species of the oxygen they need to survive (Environment Canada, 2011). In

addition, this blue-green algae can produce toxins that are harmful to humans and wildlife. Scientists have found three major toxins in the algal blooms; neurotoxins (affects the brain), hepatotoxins (affects the liver), and dermatotoxins (causes irritations when in contact with the skin). Even though documented cases of blooms that produce neurotoxins are rare in Canada, studies have shown that these toxins can result in paralysis and respiratory failure (Environment Canada, 2011). More commonly, scientists have been seeing health effects from people who have come into direct contact with the algae through recreational activity in the water. People who have been exposed to the blooms have shown evidence of skin irritations, eye and ear infections, hay fever symptoms, vomiting, and abdominal pain (Environment Canada, 2011). All of these devastating health effects are going to continue to affect both humans and wildlife if we don't find a solution that will help stop the growth of the destructive algal blooms.

All the detrimental effects of the algal blooms have proven to be extremely harmful to Lake Winnipeg's ecosystem. Fortunately, The Lake Winnipeg Foundation is dedicated to solving the lake's health issues and has already found a couple solutions to its problems. This foundation has researched and come up with a detailed health plan featuring eight ways to protect and restore the balance of Lake Winnipeg's ecosystem. One solution that will reduce the amount of algal blooms in the lake is to protect wetlands at all costs. As mentioned earlier, wetlands can help filter out the harmful nutrients that would otherwise end up in the lake. However, the number of wetlands have been decreasing rapidly, causing more and more dangerous chemicals to dissolve in Lake Winnipeg. Action 1 of the Lake Winnipeg Health Plan is to protect all the remaining wetlands and any future drainage of these areas will require compensatory actions to replace these valuable ecosystems. The Lake Winnipeg Foundation will also develop and fund engineered solutions that will mimic the natural function of wetlands and will hopefully reverse the damage done in the past. Another way that will help restore health to Lake Winnipeg is to plant cattails in the lake itself. In an article from CBC News, specialists at Native Plant Solutions tell us that "cattails are like the workhorses of wetland systems" because they need phosphorus and nitrogen in order to grow. Since the buildup of phosphorus and nitrogen is the root of the problem in Lake Winnipeg, researchers believe that planting the nutrient absorbing cattails can drastically decrease the amount of harmful chemicals in the lake. Both of these solutions are sustainable and can be carried out for many years to come. However, neither of these solutions won't work for as long as they could unless everyone pitches in and makes an effort to reduce the amount of harmful substances that ends up in Lake Winnipeg.

Action 8 of the Lake Winnipeg Health Plan talks about taking responsibility for our actions and reminds us that "we're all in this together" (Lake Winnipeg Foundation). We need to accept responsibility for the water we use every day and make positive changes that will reduce the impact we have on Lake Winnipeg's health. While it is easy to point fingers at other people and blame them for what is happening to our lake, we each need to take a step back and look at how we are contributing to the lake issues. The Lake Winnipeg Foundation encourages us to play a role in the solution by conserving our home water use, buying phosphate-free soaps and cleaning products, and spreading the news to our friends and neighbors. These simple, everyday actions can make a huge difference in the wellbeing of our lake and can lead to a healthier Lake Winnipeg.

All of our destructive human activities have been major contributors to the issues that Lake Winnipeg has been having lately. The excess of nutrients found in fertilizers are flowing into the lake, leading to toxic algal blooms and other issues that are detrimental to this valuable body of water. Fortunately, scientists have dedicated their time and resources to finding a solutions to the problems in Lake Winnipeg. Research has found that if we protect our wetlands and grow cattails, we can help reduce the amount of dangerous chemicals that is infiltrating into Lake Winnipeg. Furthermore, we as a community need to realize that each individual is also an important part of restoring health to our lake, and that improving our actions will definitely make a positive difference to this essential ecosystem.

References

- Lake Winnipeg Foundation. (2017). *Lake Winnipeg Health Plan*. Retrieved January 22, 2017, from <http://www.lakewinnipegfoundation.org/lake-winnipeg-health-plan>
- Canadian Broadcasting Corporation. (2013, July 27). *Cattails could help restore Lake Winnipeg*. CBC. Retrieved January 22, 2017, from <http://www.cbc.ca/news/canada/manitoba/cattails-could-help-restore-lake-winnipeg-1.1322978>
- Lake Winnipeg Foundation. (2017). *Harmful Algae Blooms on Lake Winnipeg*. Retrieved January 22, 2017, from <http://www.lakewinnipegfoundation.org/harmful-algae-blooms-lake-winnipeg>
- Weis, A. (2017). *Lake Winnipeg Named World's Most Threatened Lake This Year*. Global Nature. Retrieved January 22, 2017, from <http://www.globalnature.org/36067/Home/Press/Press-Archives/resindex.aspx?newsid=1573&newsrefid=36067&row=0&newsrefaddcoid=&nafrom=&nato>
- Water Stewardship Division. (2017). *Lake Winnipeg Quick Facts*. Manitoba Government. Retrieved January 22, 2017, from https://www.gov.mb.ca/waterstewardship/water_quality/lake_winnipeg/facts.html
- NASA. (2017). *The Importance of Freshwater*. Retrieved February 08, 2017, from <https://pmm.nasa.gov/waterfalls/science/freshwater>
- Liquid Assets. (2009, April). *Teacher Newsletter of the Slow the Flow Water Education Program*, 1-2. Retrieved February 08, 2017, from <https://www.fortwhyte.org/wp-content/uploads/2015/08/SlowTheFlow-LiquidAssets-Spring2009.pdf>

Environment Canada and Manitoba Water Stewardship Division. (2011, June). *State of Lake Winnipeg: 1999 to 2007*. Government of Canada. Retrieved February 08, 2017 from <https://www.ec.gc.ca/Publications/2348DE75-65E4-46D0-8277-9FAF6FB11DFC/StateOfLakeWinnipeg19992007Highlights.pdf>

Wikipedia. (2016, September 26). *Lake Winnipeg algae threat*. Retrieved February 08, 2017, from https://en.wikipedia.org/wiki/Lake_Winnipeg_algae_threat

Babaluk, N. (2010, November 18). *Historic Hecla*. Retrieved February 08, 2017, from <http://www.winnipegfreepress.com/opinion/blogs/babaluk/Historic-Hecla-109007869.html>