

They have no idea they're eating microplastics. You probably don't either.

Microfibre plastics are polluting Georgian Bay. These tiny strands are a form of microplastics that are less than 5 mm in length! They are difficult to see, almost impossible to clean up, alarmingly increasing in our environment and being found in the food chain.

Plastic microfibres are in our water.

A study on three of the Great Lakes (Superior, Huron, Erie) showed the average abundance of microplastics in surface water was approximately 43,000 particles per square kilometre. A 2014 sampling of surface water and rivers that feed into Lakes Erie and Ontario had recorded abundances between 90,000 and 6.7 million particles per square kilometre. These levels of microplastics are similar to concentrations in the oceans such as the "Great Pacific Garbage Patch".

The kinds of microplastics found in these studies are largely fibres, fragments and spheres. Fibres (microfibres) are found to be to be the most common.



Photos: The Rochman Lab



Nylon ropes, foam from docks and buoys break down into tiny fragments.



Pulled from Georgian Bay, April 2019.

Cigarette butts and foam bits are sources of microfibres and microplastics.

Where do microplastics come from?

They come from products we use. Their abundance is growing in the environment because we don't **refuse, re-use or capture and dispose** of plastic with care, especially single-use plastic. And our bin recycling programs are simply not the answer, given that recycling rates for Canada are at 11%.

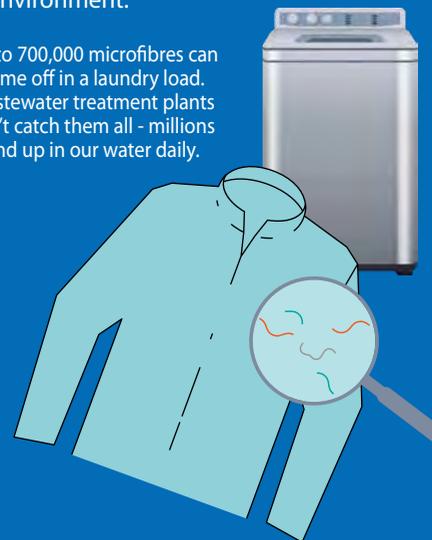
Sources. Microplastics come from large pieces of plastic litter like coffee lids, cutlery, foam dock materials and nylon ropes. They continually break down through weathering into smaller and smaller pieces, but never go away completely. They can come from accidental dumps of 'nurdles', which are used in production to form plastic products during transport. Personal care products are another source of microplastics. One form, microbeads has largely been banned, however microfibres/plastics are still coming from products like wipes and contact lenses.



Do not flush contact lenses.

One little known source of microplastic pollution is from fibres in clothing. Almost 80% of clothing manufactured today is estimated to contain artificial fibres such as polyester, nylon, Spandex™, acrylic and others. When these fibres are shed from clothing into our water through washing or direct contact like swimming, they don't biodegrade like natural fibre but begin to slowly accumulate in our aquatic environment.

Up to 700,000 microfibres can come off in a laundry load. Wastewater treatment plants can't catch them all - millions end up in our water daily.



Is it harmful to consume microplastics?

We can't say for sure. Research hasn't caught up to the incredible pace of our pollution, but Georgian Bay Forever is working with partners on initiatives to mitigate plastic pollution and many researchers are working to understand its impact on human health.

However, the growing body of research shows that the effects of microplastics on animal life are far-reaching. Researchers have investigated the impacts of microplastics on gene expression, individual cells, survival and reproduction. Mounting evidence shows the negative impacts can include decreased feeding and growth, hormone system disruption, decreased fertility, as well as other lethal and sub-lethal effects. While some effects are due to ingestion stress (physical blockage), there are also risks to ecosystems in the Great Lakes from the chemicals in plastic used in production or the potential absorption of chemicals into microplastics from the surrounding environment (e.g. flame retardants like PBDEs).

More and more research shows animals and humans are consuming microplastics.

One example is from the Rochman Lab research, which found microplastics in the gut of every sample of fish from Lakes Huron and Ontario. It's not just fish. Researchers from the University of Minnesota and the State University of New York at Fredonia tested Great Lakes beer, globally sourced tap water, and commercial sea salt to determine if they were contaminated with microfibres. They found that 81% of the tap water samples contained microfibres, as did 100% of the beer and salt samples tested! Furthermore, a University of Victoria 2019 study estimated that humans consume between 39,000 to 52,000 particles annually, not including airborne particles.



Photo: Paul Weeks

The time to act is NOW! We can help.

GEORGIAN BAY FOREVER

Protecting your water.



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How can YOU help?

1. Wash your clothes less often.

Washing processes are stressful on your clothing. If we reduce our laundering, there are fewer opportunities for plastic fibres to come off and a better chance to increase your garments longevity. Air drying is also better than using the dryer. While you're at it, always do full loads to save energy.

2. Consider using cold water in your laundering.

While not every fabric has been tested, research has shown that polyester sheds more fibres at higher temperatures. Managing your garments with care means they will last longer with less fraying and shedding.

3. Use front load washing machines.

Hartline's study showed that front load washing machines had 7x less microfibres than top load machines.



Use front load washing machines.

4. Buy a filter for your washing machine.

There are a variety of types on the market. Of the three tested by the Rochman Lab research, the most effective type is an outside filter that can remove up to 89% of microfibre emissions.



Filter capture after one month of washing mostly synthetics.

5. Be stylish, but don't do fast fashion.

Constant purchasing of clothes has led to a huge increase in clothing made with synthetic and low quality materials, and resulted in microfibre pollution and clothing waste furthering greenhouse gas emissions.

Reduce your purchases, buy used clothes from vintage or thrift stores, trade with your friends, rent party dresses, and buy durable pieces that can be mixed and matched.

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6. Refuse. Find ways to avoid single-use plastic.

Make it a habit to have options on-hand to replace single-use plastic. Some examples include: traveller mugs and water bottles, cloth and mesh bags for shopping and the grocery store, re-useable cutlery, straw packs and containers for leftovers and lunch, and beeswax wraps instead of plastic wrap.

7. Re-use and re-purpose your clothing and plastic.

Don't throw away old garments; find ways that they can be repaired or re-purposed into cleaning rags, gift bags or donated ethically. The Internet is full of interesting crafting solutions for your old clothes. Old plastic toys can be new again for someone else. If you have plastic bags, re-use them and wash if necessary. Investigate if they can be recycled.

8. Choose products and retailers with less wasteful packaging.

Where possible, make a choice to buy from a brand that takes care in reducing its packaging or makes packaging from recycled and recyclable materials. Buy in bulk.



Photo: Sara Carter

Choose shampoo and conditioner bars that do not come with excess packaging.

9. Research your recycling.

Understand that recycling is not the answer to the plastic problem at this time because the market for recycled materials is uncompetitive and poorly developed. **Reduce what goes in your recycling bin by refusing plastic. That is the best practice.** Then, follow by ensuring that the materials you are putting in recycling are not contaminated. Research what can be recycled in your municipality (there are many differences) and make a decision to rigidly follow guidelines.

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Be the Solution to Plastic Pollution



#GBFTrashTeam

10. Join a shoreline clean-up.

Join others or start your own group to pick up the trash that ends up on our shorelines. Georgian Bay Forever is helping communities and volunteers in the east and south parts of Georgian Bay organize groups to pick up shoreline litter, sort it, measure it and recycle the plastic where possible. To find out more, please email us at cassie.weston@gbf.org with the subject line: GBF Trash Team Volunteer.

There are certainly other ways and other research on ways to reduce plastic. We would love to hear your ideas and comments. Please email us at info@gbf.org or volunteer for one of our committees.



Litter picked up on the shores of Georgian Bay.

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About Georgian Bay Forever

Georgian Bay Forever is a registered Canadian charity founded in 1995 that funds and supports scientific research, restoration projects and education that protects and enhances the waters of Georgian Bay, as part of the Great Lakes.

We are concerned about plastic pollution in Georgian Bay.

Our project, *Divert and Capture: The fight to keep microplastics out of our water* is a two-year project supporting several important initiatives and goals:

1. Physically diverting microplastics/microfibres from entering our water at the source, and measuring the impacts in three separate research studies.
2. Engaging the community in hands-on clean-up of the shorelines.
3. Providing the public with information on what microplastics are, why they are so harmful to the water and animals, how they affect the water quality and most importantly, providing practical tips on how we can all reduce plastics getting into the environment.

This project is undertaken with the financial support of the Government of Canada through the Federal Department of Environment and Climate Change.

Further funding and assistance was provided by the RBC Foundation, Patagonia, the Helen McCrea Peacock Foundation and our many passionate donors.

Here are ways you can help us find solutions for the pollution that impacts our water.

Donate at gbf.org. We make every dollar stretch.

Volunteer at info@gbf.org. We'll provide you with the knowledge and tools to work in the field, helping care for the place you love.

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THANK YOU TO THESE SOURCES

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