

Microplastics: Polluting Our Great Lakes

What is plastic?

Plastic was invented in the early 1900's yet we now find plastic everywhere, from furniture to clothing to construction material. The vast majority of plastic is made using fossil fuels. The petroleum is distilled into primary chemicals such as ethylene or xylene. Chemical catalysts and solvents are then added to create a long chain of molecules called a polymer. The polymers are blended with additives, such as flame retardants or plastic softeners, to give the characteristics needed for the end product. The plastic is cooled, then extruded into small pellets called 'nurdles' for shipment to factories where they are molded into plastic products.

Recycling plastic

Different plastics are made from different ingredients according to secret formulas. This makes it very difficult to recycle the plastic into a pure uncontaminated form. Most plastics are therefore 'downcycled' or made into lower quality plastic products.



5Gyres.org

Microplastics—tiny pieces of plastic less than 5mm in size—have been found in all five of the Great Lakes. Concentrations of plastic pollution in Lake Erie are some of the highest in the world¹.

There are more than 5 trillion plastic pieces weighing over 226,000 tonnes in the world's oceans, according to recent research². Ocean currents cause this plastic garbage to accumulate in five large gyres where the plastic breaks down into smaller and smaller pieces. The Great Lakes also have their share of plastic garbage, and much of it is barely visible to the naked eye.

Microplastics end up in the Great Lakes in several ways:

- Larger plastic garbage never really goes away. It just breaks down into smaller and smaller pieces when exposed to sunlight, wave and wind action.
- Some consumer products—such as exfoliating body scrubs and toothpaste—contain tiny plastic 'microbeads' that go down the drain when we use them. These microbeads are not all captured at wastewater treatment plants, so they make their way into the Great Lakes.
- Much of our clothing—such as fleece and nylon—is made from synthetic (plastic) textile. Every time we wash our synthetic clothing, some of the plastic fibres end up in the Great Lakes.

Microplastics don't float forever. They may get covered in micro-organisms and sink to the lake bottom, or end up in beaches or plant matter where they are impossible to clean up. Or they may get eaten by birds, fish, invertebrates such as mussels, and other aquatic life. Microplastics:

- can create internal blockages in wildlife, leading to dehydration and starvation.
- concentrate chemical pollutants—such as PCBs and other persistent pollutants—from the surrounding water. These toxic chemicals are passed on to birds, fish and other organisms that eat the plastic, where they are concentrated even further and can affect the organisms' hormone systems.

¹ Eriksen, M et al., *Microplastic Pollution in the Surface Waters of the Laurentian Great Lakes*. Mar. Pollut. Bull. (2013)

² Eriksen, M. et al., *Plastic pollution in the world's oceans: more than 5 trillion plastic pieces weighing over 250,000 tons afloat at sea*. PLoS ONE 9(12): e111913. (2014) doi:10.1371/journal.pone.0111913

Take action on plastic pollution!

KEEP PLASTIC OUT OF THE WASTE STREAM

The best way to get microplastics out of the Great Lakes is to make sure they never get there in the first place. **Reduce your use of plastic products** because they may end up in lakes and rivers where they break down into smaller and smaller pieces.

- Avoid single use disposable products like plastic shopping bags, cups and dishes or plastic takeout containers. Prefer re-useable containers of stainless steel, glass, wood or ceramic.
- Avoid purchasing water in plastic bottles. Using tap water is safe, economical and non-polluting.
- Do a 'plastics' inventory of your shopping cart before heading to the cash register. Are you buying items with minimal—and plastic-free—packaging? Can you substitute plastic-free alternatives for some of your purchases?

AVOID PRODUCTS CONTAINING MICROBEADS

Tiny plastic 'microbeads', used as scrubbing agents or exfoliants in personal care products, are often brightly coloured and can be seen in suspension in the body washes or facial scrubs containing them. These microbeads are not all captured at wastewater treatment plants, so they make their way into the Great Lakes.

- Read labels and choose products that do not contain 'microbeads' or the plastics from which they're made—'polyethylene' or 'polypropylene'.
- Choose exfoliants and scrubbing agents made from sea salt, oatmeal, crushed apricot pits or walnut shells instead.

PREFER NATURAL TEXTILES TO SYNTHETIC

Many of the fabrics we use to make clothing and other consumer products are actually plastic products. Nylon, vinyl, orlon, lycra or spandex, or synthetic polyesters such as polar fleece are all manufactured from refined and blended petroleum products that are spun into fibres. When synthetic clothes are laundered, the plastic fibers are released into the washing water. These fibres are not all captured at wastewater treatment plants, so they make their way into the Great Lakes.

- Read labels and choose natural fibres such as cotton, flax (linen), hemp, wool, silk, cashmere or mohair, camel hair, angora, alpaca, jute, sisal, coir, ramie or bamboo.



www.ecosuperior.org
P: 807 624 2140 F: 807 622 0005
562 Red River Road, Thunder Bay, ON P7B 1H3

