

LAKE ONTARIO'S PLASTIC CONTAMINATION

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Lake Ontario, the smallest of the Canadian Great Lakes, is a victim of plastic pollution, Earth's most massive ecological disaster. The Plastic Ocean Project announced that a yearly three million pounds of plastic are slowly swallowing Lake Ontario's entirety; plastic pollution is thriving. Stepping into 2021, the recurring question that should be on everyone's mind: How do we save Lake Ontario from further plastic contamination?

Human oversight combined with plastic equals the blame for Lake Ontario's plastic infection. Canada frequently uses plastic appliances and rarely considers proper disposals or environmental repercussions. These negligent implications lead the Canadian Environmental Defense to determine that 90% of all plastic is deliberately discarded in water bodies, proceeding in Lake Ontario's pitiful state. The plastic itself is a versatile substance prevailing in items ranging from bottles to automobiles and is fatally nondegradable. This material spends approximately 450 years decomposing. Thus, every piece of plastic in Lake Ontario's environment lingers and merges to the immense quantity present today.



Plastic pollution infesting a body of water like Lake Ontario.
(Credit: Rich Carey/Shutterstock).

Plastic pollution directly addresses the UN Department of Economic and Social Affairs' sixth Sustainable Development Goal (SDG): safe drinking water. Plastic's toxicity leeches fatal bisphenol A (BPA) chemicals to its surroundings, degrading the lake's sanitation. Plastic debris eventually corrodes into

smaller fragments invisible to the naked eye. When swallowed, the undetectable microplastic particles disperse their venomous properties inside the consumer on a cellular level, breeding a host of health issues, including cancer, infertility, unusual obesity, etc. As a freshwater lake, nine million residents rely on Lake Ontario for a sanitized, available drinkable water supply yet fall prey to these casualties. The International Institute for Sustainable Development indicates that Canada's economy has plummeted with a loss of nearly \$8 billion repurposed towards these damages, headed for \$11 billion by 2030.

One of our biggest saviours countering plastic pollution is the numerous marine species dwelling in Lake Ontario's ecosystems. However, they are not exempt from the plastic catastrophe. The aquatic animals protect the lake from further contamination by devouring diluters through intuitive behaviour, acting as a purifying filter. Digesting plastic pollutants will painfully lodge in their bodies resulting in death. Costing the lives of numerous creatures who have toiled to preserve our well-being, plastic pollution has proven its destructive influence on all lives.

Plastic contamination was first noticed 61 years before 2021. Amongst the six decades, Lake Ontario suffered more and more, and currently, the correction period to save the lake from complete plastic pollution is exponentially dwindling. Allowing plastic pollution's unabated continuation will inevitably invite worldwide water defilement. *"It is the worst of times, but it is the best of times because we still have a chance,"* quotes Sylvia Earle, renowned marine biologist and plastic pollution activist. Our prompt responsibility is to pool resources and effort in conceiving a permanent solution.



An innocent turtle about to devour plastic debris to purify the lake, that will die in the process. (Credit: Rich Carey/Shutterstock).

The Government of Canada reserves ownership of Lake Ontario and has initiated operations to combat plastic pollution. This year, the *Canadian Environmental Protection Act* (CEPA) banned single-use plastic, ensuring manufacturers are held accountable for collecting and recycling their plastic waste. Local stakeholders like Greenpeace have also risen to the challenge, fabricating petitions and designing a nationwide movement to reduce plastic utilization. Valid intentions aside, these measures are leading to controversial public reactions. “I use plastic in everything. I’m never giving it up,” asserts a concerned Ontario citizen, who will remain nameless to preserve privacy. Addicted to a plastic lifestyle, and changing now irrelevant, numerous residents with identical resolute opinions will never comply with these restrictions. Despite the absence of public support, there are active movements to successfully reduce plastic pollution.

Satellite imagery captures photographs of Earth and anticipates fluctuations of weather. This purpose corresponds to plastic’s unique response to absorption and reflection of heat and light. Once adapted to Lake Ontario’s currents, the satellite can use the “Floating Debris Index” (FDI) to track the deserted plastic and pluck its presence from the water, even accounting for unpredictable migrational patterns. Lauren Biermann, an observation scientist at Plymouth Marine Laboratory, uncovered this revelation and used its capabilities on Accra, Ghana, the San Juan Islands, and plenty more coastal waters with an accuracy of 86%. This procedure could advance with cloud computing and reactive artificial intelligence. Cloud computing is an array of computer system resources not necessitating management. Reactive artificial intelligence is technology perceiving their surroundings and responding. In conjunction with satellite imaging, the duo will expand the vision range and implement digital assistance for quicker applications to monitor and confine plastic from Lake Ontario and eventually all inland water.

Rainwater harvesting systems are another viable solution. Plastic is repeatedly discarded in diverse Ontario locations but infiltrates Lake Ontario through surges of excess rainwater. In place of abetting a global dilemma, the rainwater can be redirected into an above-ground container before contact, warding this route for plastic pollution. The salvaged liquid can diminish Lake Ontario from harbouring more plastic shards in its waters and simultaneously prevent water corruption in the most impactful way, as while colliding across the surface, plastics amass in corroding grime and bacteria. The raindrops can also stimulate into an alternative drinking source, with most raindrops seeping into the soil and meaninglessly vanishing underground.



Plastic in rainwater, merging with other grimy debris.

(Credit: Mikko Palonkorpi/ Shutterstock).

Conservation of Lake Ontario is only the first phase in ridding plastic pollution. The rectification steps can be executed in collaboration with every global terrestrial land neighbouring a plastic-stricken water body- we are all within the same circumstances. Lake Ontario and all lakes alike implores aligned humanity for action. It started with and ends with us.

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