

Real World STEM Connection

1. City of Kingston to do its part to remove plastics from Lake Ontario

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If you notice a yellow-and-grey bin attached to the side of a dock in a local marina, don't be alarmed. It is collecting plastics from Lake Ontario.

The contraption, called a Seabin, is part of the Great Lakes Plastic Cleanup and was installed on Wednesday.

"Lake Ontario holds a special place in the hearts of many Kingstonians," Amy Gibson, manager of recreation services at the city, said in a news release. "We rely on it for swimming, boating, fishing and so much more. Not only does it provide us with many recreational opportunities, support tourism, provide a home to countless wildlife, and offer one of the best views in the city — it connects us to communities hundreds of kilometres away, in Canada and across the border."

The Great Lakes Plastic Cleanup states that 107 million people who live along the Great Lakes rely on their ecosystem and that 10 million kilograms of plastic litter is estimated to enter the Great Lakes every year. There are 3,500 species of plants and animals in the lakes and 21 per cent of the world's fresh water supply — an estimated 22.7 quadrillion litres — is within the Great Lakes.

The Seabin acts like a floating garbage bin, collecting debris, macroplastics and microplastics, and even microfibres.

"It's incredible, and if you can picture it, it's a bit like a Roomba on water," Gibson said.

The news release explained that every few days, the Seabin will be emptied and the contents will be examined by researchers at Queen's University.

In 2020, Seabins along the Great Lakes captured about 103 pieces of garbage every day. Of that garbage, 30.8 per cent was categorized as small foam pieces, 22.2 per cent was small film pieces, 20.5 per cent was small hard fragments, 13.4 per cent was small pellets, and the

remaining 33.6 per cent was made up of large foam pieces, large film pieces, large cans, large fragments, large food wrappers and cigarette butts.

While many people appreciate Kingston's waterfront, pollution continues to be an issue throughout the Great Lakes. Researchers estimate that 10 million kilograms of plastics enter the Great Lakes every year, polluting the lakes and surrounding watersheds — something that could cost up to \$400 million annually to combat.

Research on plastic pollution pathways and long-term environmental impacts is evolving rapidly, and microplastics pose a great danger. Found in surface water, sediment and in wildlife within and around the Great Lakes, microplastics reach as high as 1.25 million particles per square kilometre — a concentration on par with what is found in the ocean's garbage patches.

The Trent Port Marina in Trenton joined the Great Lakes Plastic Cleanup project in August 2020. On average, its devices captured 97 pieces of garbage every day. They mainly picked up large foam pieces, small foam pieces, small fragments and small pellets.

The city promised to provide regular updates on the local Seabin via social media.

For more information, check out @GLPCleanup and #LittleBitsBigProblem on Twitter, and visit www.greatlakesplasticcleanup.org.

2. Cities and Countries aim to slash plastic waste within a decade

Authors: Chelsea Rochman, [University of Toronto](#), Diane Orihel, [Queen's University, Ontario](#)

Article take from *The Conversation*:

<https://theconversation.com/cities-and-countries-aim-to-slash-plastic-waste-within-a-decade-114790>

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If all goes well, 2030 will be quite a special year.

Global and local community leaders from more than 170 countries have pledged to “significantly reduce” the amount of single-use plastic products by 2030. Success would result in significantly less plastic pollution entering our oceans, lakes and rivers.

Today, societies around the world have a love affair with disposable plastics. Just like some love stories, this one has an unhappy ending that results in plastic bags, straws and takeout containers strewn about the global environment.

As researchers who study the contamination and effects of plastic pollution on wildlife, it would be nice if by 2030 we no longer heard about plastics showing up in the stomachs of dead whales, littering the beaches of distant islands and contaminating tap water and seafood.

Plastic doesn't belong on the beach.

It is time for some good news about the environment, including stories about how cities and countries are managing plastics and other waste materials in more sustainable ways, and how children will have cleaner beaches to play on.

No reason to wait

Scientists have known about plastic pollution in our oceans for more than four decades. It is pervasive in rivers, lakes and soils too. Plastic pollution knows no boundaries, with small bits of plastic found from the equator to the poles and even on the remote slopes of the French Pyrenees mountains.

Plastic waste damages ecosystems, smothers coral reefs and fills the bellies of sea life. In the absence of action, the amount of plastic waste produced globally is predicted to triple between 2015 and 2060, to between 155 and 265 million tonnes per year.

As a welcome response, global leaders have decided to act. At the UN Environment Assembly in Nairobi in March, environment ministers from around the world signed a voluntary commitment to make measurable reductions in single-use plastic products, including straws, shopping bags and other low-value plastic items that are sent to landfill after being used once.

Similar goals to deal with plastic pollution have been introduced by municipal, provincial, federal and regional governments across the globe. Non-profit organizations and industry leaders are making efforts to tackle the problem of plastic pollution. For example, Ocean Conservancy is uniting citizens and organizations around the world in cleanups to meet their goal of an ocean free of plastics by 2030, and Unilever has pledged to use 100 per cent recyclable packaging by 2025.

Canada joins the movement

Canada introduced the Ocean Plastics Charter at the G7 summit in 2018, committing nations to work with industry to make all plastics reusable, recyclable or recoverable by 2030. That means sending no plastic waste to landfill.

Vancouver aims to be a zero-waste city by 2040. Although the city has reduced the mass of waste going to landfill by 23 per cent since 2008, it still has a long way to go.

Ontario also has its sights on being waste-free by developing a circular economy, which means keeping materials in use for as long as possible. The province aims to cut the amount of waste sent to landfills in half by 2030, a reduction of 4.5 million tonnes, through reuse and recycling.

To propel Ontario into action, Ian Arthur, the member of the Ontario provincial parliament for Kingston and the Islands introduced a private member's bill in March to eliminate Ontario's use of non-recyclable single-use plastic products such as straws, coffee cups and plastic cutlery, which ultimately end up in landfills. These plastics do not feed into a circular economy.

In addition, school children in Ontario are working towards collecting 10,000 signatures on petitions to ban single-use plastics in the province.

Canadians would like to see more action against plastic waste. According to a recent poll, 90 per cent of Canadians were either very concerned or somewhat concerned about the environmental impact of plastic waste, and 82 per cent thought government should do more to reduce plastic waste.

Bye bye plastic waste

Our research, and the research of others, has found that single-use plastic products litter our beaches and coastlines, small pieces of plastics contaminate our Great Lakes and the Arctic Ocean, and microplastics are present in our sport fish and drinking water.

Ambitious global, regional and local collaborations are sorely needed to truly realize these goals. It's time to commit to ending the love affair with disposable plastics.

Individual action does work. Quench your need for caffeine by using a reusable mug. Hydrate with water from a durable and refillable bottle. Purchase groceries that come in containers that can be reused or recycled. Plan your kid's birthday party and your work meetings without using disposable single-use plastics.

A decade of positive habits could lead to a future where plastic is no longer waste, but valued as a material that can be reused and recycled — shifting our current paradigm to a more sustainable one that lasts far beyond 2030.