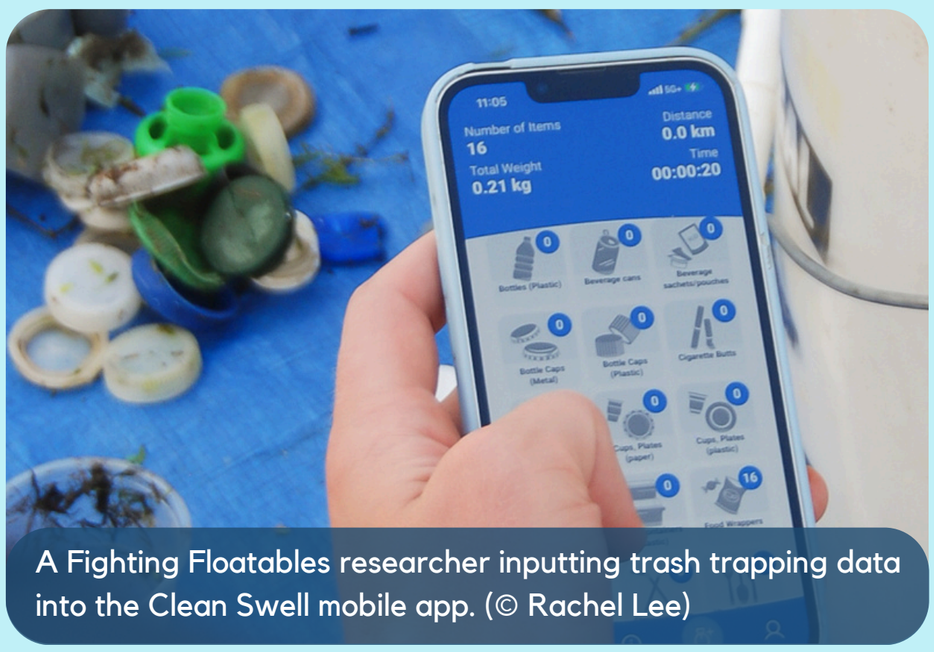
TRAPPING TRASH IN THE TORONTO HARBOUR: 2025 DATA SUMMARY

PROJECT OVERVIEW

Since 2019, the U of T Trash Team's Fighting Floatables project has diverted, quantified and characterized anthropogenic debris found along Toronto's waterfront. This work contributes to the Toronto Inner Harbour Floatables Strategy, a collaborative strategy with a mission to reduce plastic pollution and other floating litter. From May to October 2025, we cleaned the Harbourfront waters using skimming nets and trash traps, removing 525 kg of anthropogenic debris, including more than 77,500 small pieces of plastic and other tiny trash (<2.5 cm). This research is multifaceted, not only serving to clean up plastic pollution but also increasing waste literacy through data collection and community outreach. Each year, we contribute our local data to our global network, the International Trash Trap Network. Here, we spotlight the quantitative impact of our collaborative trash trapping program and inform next steps and opportunities for pollution prevention upstream.

The crowd at our Trash Trap Drive, a community science outreach event. (© U of T Trash Team)



A Fighting Floatables researcher inputting trash trapping data into the Clean Swell mobile app. (© Rachel Lee)


A Fighting Floatables researcher sorting through skimmed material. (© U of T Trash Team)

THE PLASTIC PROBLEM

The Great Lakes provide essential ecosystem services, accounting for 20% of the world's available fresh surface water, providing habitat for aquatic and terrestrial species, and serving as the primary source of drinking water for over 80% of Ontarians.[1] Nonetheless, estimates project that the Great Lakes hold 6 million pieces of plastic per square kilometre,[2] with an estimated 10,000 metric tons of plastic entering the lakes each year.[3] A perceptive observer walking along our shoreline may recognize a variety of anthropogenic debris floating on the water surface, such as food wrappers, bottle caps, and packaging. Equally important, however, is the less identifiable, smaller anthropogenic debris, including microplastics, which can accumulate in wildlife[4] and have adverse health effects. These large and small types of anthropogenic debris accumulate in the sediments and shorelines of the Great Lakes. Projects like ours, focused on cleanup, monitoring, and the prevention of plastic pollution in our Great Lakes, can inform effective solutions and reduce risks to humans and wildlife. Through cleanup efforts, field research, and community outreach, we aim to protect the many services the Great Lakes provide.


Plastic cups collected from one skimming session. (© U of T Trash Team)


A pile of skimmed anthropogenic debris entangled in invasive aquatic plants. (© U of T Trash Team)

Skimmed litter sorted into waste categories. (© U of T Trash Team)

OUR TRASH TRAPPING METHODS

Fighting Floatables researchers skimming in Peter St Basin (left); skimming net pulling plastic bag out of water (right) (© U of T Trash Team)

SKIMMING removed
55,252 large items

Manual skimming along Toronto's Inner Harbour removed 485 kg of waste, 92.4% of the season's total. Food wrappers, plastic bottle caps, and foam packaging were the three most abundant items from skimming, making up 1/3rd of all large anthropogenic debris items.

SEABINS removed
9,459 large items
68,720 small items

2 Seabins were placed along the Inner Harbour and 3 at the Outer Harbour Marina, continuously drawing in floating debris. Seabins removed 28 kg of anthropogenic debris in total. Top large items included plastic fragments, food wrappers and bottle caps. Our Seabins collect most of the small plastic we divert over the season, collecting more than 65,000 small pieces in 2025.

A Seabin collecting water (left); a Fighting Floatables researcher holding a Seabin catch bag full of litter and aquatic plants (right) (© U of T Trash Team)

A WasteShark pulled out of water (left); a Fighting Floatables researcher operating a WasteShark by remote control (right) (© U of T Trash Team)

WASTESHARKS removed
1,088 large items
4,045 small items

The WasteShark was operated in cooperation with the Toronto Port Authority and removed 5 kg of anthropogenic debris. This remote-controlled aquadrone allows us to target and collect floating anthropogenic debris that is farther away.

LITTATRAPS removed
4,116 large items
4,738 small items

Ten LittaTraps were installed in storm drains along Queens Quay with the support of the City of Toronto. The internal catch bag collects anthropogenic debris that washes into storm drains, preventing waste from entering the lake. They trapped 8 kg of anthropogenic debris. Top large items included cigarette butts (~61% of all collected large anthropogenic debris) and food wrappers.

A LittaTrap full of leaves and litter (left); a City of Toronto worker installing a LittaTrap into a storm drain (right) (© U of T Trash Team)

Total Anthropogenic Debris Diverted (All Sizes and Methods)

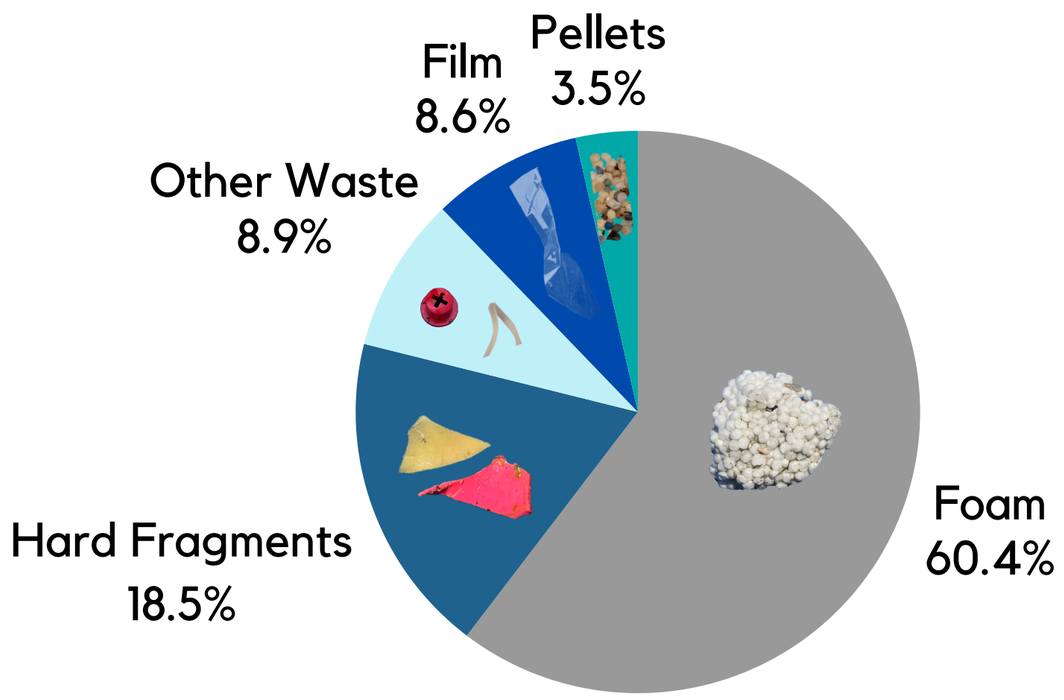
525 kg 147,418 items

Top 10 Large Identifiable Items Collected (>2.5 cm)

1. Food Wrappers (e.g., candy, chips)
2. Bottle Caps (plastic)
3. Cigarette Butts
4. Foam Packaging
5. Tobacco Products (e.g., lighters, cigar tips)
6. Other Bags (plastic)
7. Straws/Stirrers
8. Film Pieces (plastic)
9. Balloons
10. Cups, Plates (plastic)

Small items of anthropogenic debris retrieved from a Seabin. (© Rachel Lee)

Small Items Collected (<2.5 cm)



Top five categories of small items (<2.5 cm) collected from Seabins, WasteSharks and LittaTraps from May-October.

How Our Data Can Inform Policy

Below are policy recommendations targeted at specific plastic item categories, informed by what we found to be most commonly collected in our trash traps and by skimming.

Bottle Caps

Plastic Bottle caps were the second most abundant large item collected during the 2025 season and have had a steady presence within the top 10 collected items over the past 7 years of our program. This item's abundance was notable when compared to plastic bottles, which had a collection rate approximately 13.5 times lower than that of bottle caps. The U of T Trash Team suggests that policy interventions to keep these bottle caps attached to these less frequently polluted plastic bottles could serve to reduce their prevalence in our lakes.

Small Foam Pieces

Small plastic foam pieces are the most prevalent small anthropogenic debris across all waste diversion methods (60.4% of all small items collected). Continued work to identify the source of this waste will be important to implement policy solutions. Among them, construction sites should be targeted for reduction efforts with better waste management and containment strategies to prevent leakage of plastic foam pollution.

Cigarette Butts

Smoking-related items, including cigarette butts and cigar tips, were abundant during the 2025 trash trapping season. Increased waste literacy to convey to the public that these items are plastic waste, in addition to physical interventions such as more prominent cigarette receptacles, could help redirect these items from the environment.

Sanitary Products and Fatbergs

Sanitary products and fatbergs (masses of toilet paper and single-use plastic wet wipes that combine and congeal in the sewer with oil and grease) were commonly spotted and removed by the U of T Trash Team, particularly after days of significant precipitation in the City of Toronto. These fatbergs demonstrate that continued efforts of community outreach and education will be critical to curb the improper flushing of these materials while they remain available for consumer purchase. Further, policy options need to be pursued to ban single-use plastic wet wipes or require more clearly labelled packaging to effectively communicate the proper disposal methods of these items.

Improved Waste Management - Infrastructure and Policy

A comprehensive approach to improve waste bin availability, design, and maintenance along the Toronto Inner Harbour could increase proper use and divert many sources of anthropogenic debris that would otherwise end up in Lake Ontario. Providing individuals with understandable (i.e., appropriate signage) and accessible options for item disposal should increase usage. However, to complement these physical interventions and waste infrastructure, policy interventions that reduce the availability of single-use packaging and promote the use of recyclable/reusable materials must be pursued to minimize individuals' reliance on single-use packaging and food wrappers, which are abundant in Lake Ontario.

References

1. Province of Ontario - Great Lakes Strategy, 2016, Website.
2. Environmental Defence - Turning the Plastic Tide, 2016, Report.
3. Hoffman and Hittinger, 2017, Marine Pollution Bulletin.
4. Earn et al., 2021, Journal of Great Lakes Research.

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