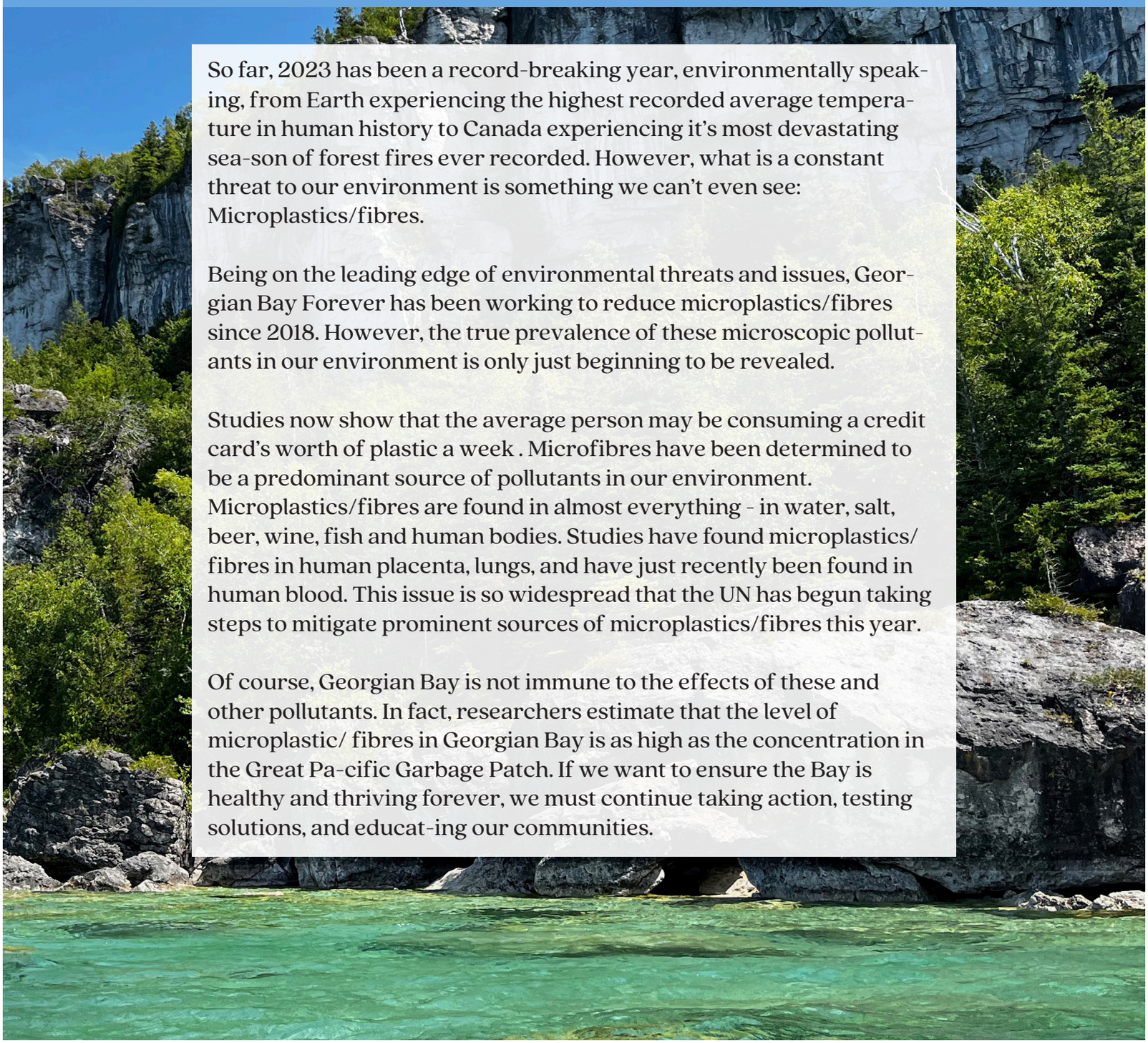
Tackling the big problems...

with your help.

GEORGIAN BAY FOREVER
PROTECTING WATER



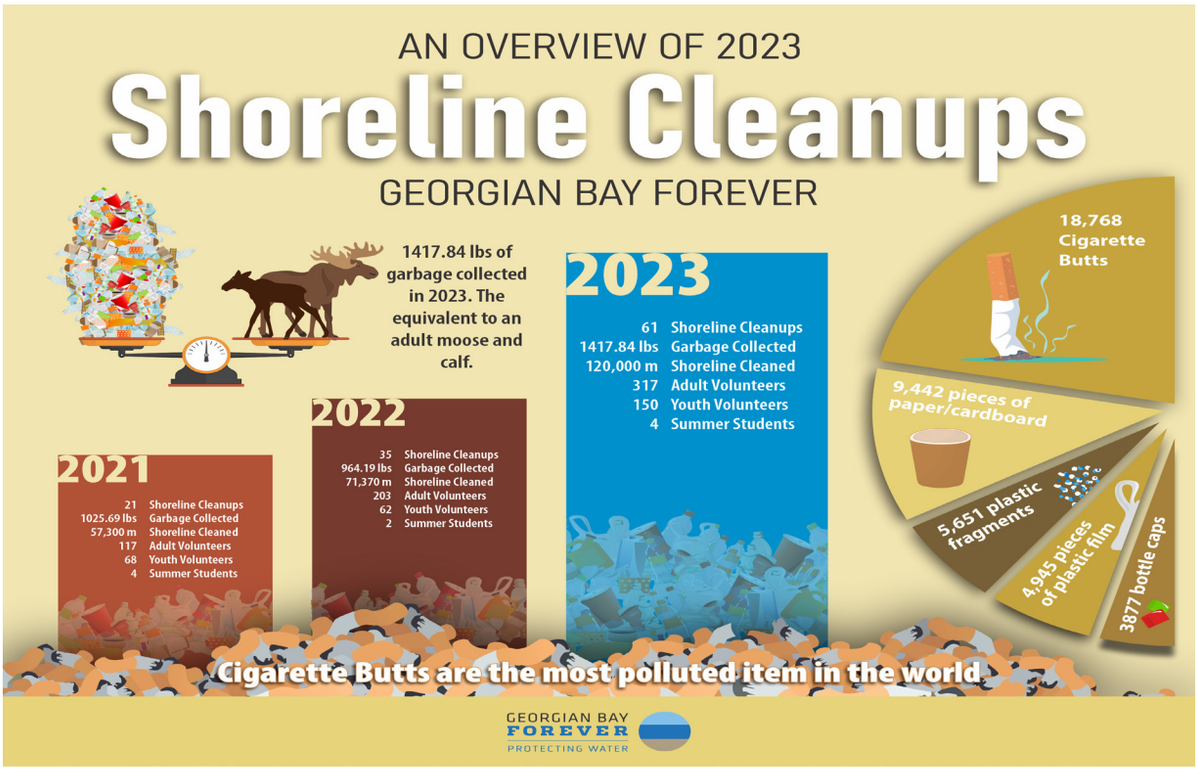
So far, 2023 has been a record-breaking year, environmentally speaking, from Earth experiencing the highest recorded average temperature in human history to Canada experiencing it's most devastating season of forest fires ever recorded. However, what is a constant threat to our environment is something we can't even see: Microplastics/fibres.

Being on the leading edge of environmental threats and issues, Georgian Bay Forever has been working to reduce microplastics/fibres since 2018. However, the true prevalence of these microscopic pollutants in our environment is only just beginning to be revealed.

Studies now show that the average person may be consuming a credit card's worth of plastic a week . Microfibres have been determined to be a predominant source of pollutants in our environment. Microplastics/fibres are found in almost everything - in water, salt, beer, wine, fish and human bodies. Studies have found microplastics/fibres in human placenta, lungs, and have just recently been found in human blood. This issue is so widespread that the UN has begun taking steps to mitigate prominent sources of microplastics/fibres this year.

Of course, Georgian Bay is not immune to the effects of these and other pollutants. In fact, researchers estimate that the level of microplastic/ fibres in Georgian Bay is as high as the concentration in the Great Pa-cific Garbage Patch. If we want to ensure the Bay is healthy and thriving forever, we must continue taking action, testing solutions, and educat-ing our communities.

Divert & Capture



Divert & Capture:

Divert and Capture is centred around keeping micro-pollutants, specifically microfibres, out of Georgian Bay. Our work on this multi-year project is focused on solutions to remove, gain understanding and educate the public about the threat of microplastics/fibres in Georgian Bay.

By the beginning of 2023, we have installed over 400 washing machine filters in Georgian Bay. We have also gained 100 petition signatures calling to pass legislation requiring all new washing machines to have built-in microplastic/fibre filters to capture the fibres that are shed while washing our clothes.

We have had one of our most successful years yet hosting shoreline cleanups, having significantly increased our event numbers, with 61 cleanup events being hosted in 2023 compared to 36 in 2022. We successfully diverted 643 kgs of pollutants, including macroplastics, from our public spaces. By removing macroplastics during our cleanups, we prevent the larger pieces from breaking down into smaller and smaller pieces and possibly being ingested by aquatic species and continuing to pollute our water.

We have dramatically expanded our efforts to educate and engage communities this year, having worked with 647 total volunteers, and have already surpassed our total 2021-2023 goals by over 1,000 volunteers. We continued our efforts to educate our communities by attending two news broadcasts centred around microplastics/fibres. We have participated in ten different festivals/events/markets so far this year.

Divert & Capture Metrics

Shoreline Cleanups

2019	2020	2021	2022	2023	2024	Beyond 2024
Goal: 10 Actual: 13	Goal: 10 Actual: 16	Goal: 10 Actual: COVID restrictions – no "organized cleanups"	Goal: 25 Actual: 36	Goal: 30 Actual: 61	Goal: 65	GBF hopes to continue to support cleanups at 65 or more per year

Amount of Garbage Collected

2020	2021	2022	2023	2024
Goal: 16 kg Actual: 337 kgs	Goal: 100 kg Actual: 842 kgs	Goal: 500 kg Actual: 437	Goal: 500 kg Actual: 643 kg	Goal: 600 kg

Education/Outreach

2018 – 2021	2021-2023
Goal: 1,300 Actual: 2,800	Goal: 3,000 Actual: 4,086

Volunteers

2020	2021	2022	2023	2024
Goal: 200 Actual: 179 Includes filter and cleanup	Goal: 200 Actual: 213 COVID restrictions	Goal: 600 Actual: 569 Includes filter and cleanup	Goal: 600 Actual: 647 Includes filter and cleanup	Goal: 250 Only shoreline cleanup moving into 2024

Filter Project 2018 - 2023

2018-2020 ParrySound	2021 – 2023 Collingwood, Wasaga Beach and Meaford	Total Filters Installed
Goal: 100 Actual: 97	Goal: 300 Actual: 304	Goal:400 Actual: 401

Tagging & Tracking Trash Trips

This research project sought to gain valuable insight on how trash interacts with wind and water currents in Georgian Bay. We simulated trash by deploying GPS-tracked bottles into Nottawasaga Bay and mapped their path. This GPS data will expand our understanding of how pollutants interact with Georgian Bay water and wind currents, informing municipalities and interested businesses where the most effective diversion and collection solutions could be installed.

During the course of this summer, our team has conducted eight major deployments of these GPS bottles. Over the coming months, the GPS data will be analyzed by our Project Advisor, Patricia Semescen, who worked on a similar project with the University of Toronto's Trash Team in the Toronto Harbour.

Mutli-Bottle Deployments:

2023
Goal: 5 Actual: 8

Diversion 2.0

This program focuses on a multifaceted approach to diverting pollutants from our waterways, creating an eco-friendly business network and supporting our partners through the use of Seabins, Gutter Bins and Trash Traps, providing valuable data by categorizing the captured pollutants while the traps are being cleaned and emptied. Through this upstream approach, we aim to decrease the amount of pollutants to be collected or diverted in the first place.

Plastic-Free Georgian Bay is taking root around the Bay, and we are pleased to welcome five new organizations to our business network this year. Through this group, Georgian Bay Forever will facilitate cooperation between eco-friendly businesses, empowering organizations to learn and work together to reduce each member's plastic use and environmental impact.

Working with our community partners and their trash-trapping technologies, we successfully diverted over 4,159 pieces of otherwise next-to-impossible to capture micro fragments of debris, providing critical data about the pollutants in the local water body.

Plastics Free Georgian Bay Members

2021-2022	2021-2023	2024
Goal: 20 New: 3 Actual:3	Goal: 20 New:5 Actual: 8	Goal: 20

Technologies combined amount captured

2021	2022	2023
Goal: none stipulated Actual: 23,237 pieces	Goal: none stipulated Actual: 25,412 pieces	Goal: none stipulated Actual: 18,429 pieces * amount reflects only debris captured through the use of Seabins.

Waste Characterizations

2021	2022	2023	2024
Goal: 20 Actual: 41	Goal: 30 Actual: 46	Goal: 35 Actual: 76	Goal: 40

Invasive *Phragmites* Removal

Invasive *Phragmites* Cutting:

GBF's longest-standing program was once again out in the field fighting to stop the spread of invasive *Phragmites*. For the past decade, we have been putting in a concerted effort to stop the spread of invasive *Phragmites* by mapping, cutting, and eventually eradicating stands of invasive *Phragmites* on Georgian Bay. Through direct intervention and enlisting local communities, we have made great strides in controlling the spread of invasive *Phragmites* and preventing them from decimating some of the province's most pristine wetlands.

By the end of our 2023 field season, the team placed a total of 704 stands into the control phase, and we are pleased to say that 490 stands are fully eradicated and 208 stands were cut. This field season has proved challenging due to unpredictable weather, which significantly reduced the number of boatable days this summer, which was exacerbated by the lower water levels converting aquatic stands to the more difficult-to-cut terrestrial ones. Despite these difficulties, the team successfully cut 20,313.5 m2 of invasive *Phragmites*.

Totals 2020-2023

	2020	2021	2022	2023
Total Sites	711	904	968	1020
New Sites	133	198	94	
# of sites Eradicated		403	514	490
# of sites Cut	170	279	270	208
# of sites Controlled	445	682	784	704
# of sites untreated	266	222	184	322

THE TOOLKIT

Over the past few years, we have been expanding our technological toolkit, thus increasing our ability to conduct scientific research in partnership with government, municipalities, educational institutions and other environmental entities. In addition to our Autonomous Underwater Vehicle (AUV), we added a remotely operated vehicle (ROV) as well as a multispectral drone to our roster.

- **Autonomous Underwater Vehicle (Georgie McBayFace):** The AUV is playing a key role in measuring water quality and is being used by our educational partners in their respective research work. The AUV is further being utilized to ground-truth nuisance algae growth in certain areas of the Bay. Equipped with sophisticated sensors it is capable of autonomously measuring the properties of water following a prescribed route. By detecting qualities like turbidity, pH levels, temperature, algae, oxygen and total dissolved organic compounds, we can measure changes in water quality over the long term.
- **The Remote Operated Vehicle (ROV)**: A recent addition to our water quality measuring toolkit is our ROV. This vehicle is equipped with an extendable arm, allowing for the collection of physical samples. It is also equipped with superior imaging capabilities, allowing us to visually determine and verify the plant life within a specified region, collecting critical data on nuisance algae blooms, and recording high quality documentation of the lake bed.
- **The Multispectral Drone:** Finally, our technologies have taken to the sky with a new multispectral drone. This drone is equipped with a multiple wavelength camera and precise positioning system that can survey wetlands to quickly and effectively determine the different forms of vegetation within a given region, increasing the efficiency of mapping invasive *Phragmites* and biodiversity.

THE CRITICAL CATCH

This year, we launched our latest project, The Critical Catch, which seeks to address the issue of marine debris in Georgian Bay. The primary emphasis is on directly removing abandoned fishing gear, educating and fostering a sense of stewardship in our communities, and providing easy-to-access monofilament receptacles for collecting broken fishing lines.

We have successfully installed all 15 large monofilament receptacles in known access points and popular fishing areas and distributed 225 personal-sized containers to the local angler community. At the end of the year, all of the collected monofilament fishing line will be shipped to Berkley to be repurposed into plastic furniture or other usable items.

In November of 2023, we will begin working alongside the Georgian Triangle Anglers Association and Simcoe County District School Board to implement a hatchery program in southern Georgian Bay schools. This will allow students to witness firsthand the spawning cycle of brook trout, instilling a lifelong connection to Georgian Bay and its wildlife.

Large Receptacles installed

2023
Goal: 15
Actual: 15

Personal Receptacles handed out

2023
Goal: 500
Actual: 225

Looking Forward: 2024 and Beyond

Georgian Bay Forever has always taken immense pride in our ability to make the highest possible impact, given our resources. Our recent accreditation by Charity Intelligence, of being ranked as one of The Top 100 Charities in Canada validates the meaningful difference we make.

In order to continue protecting Georgian Bay, we need to focus on expanding our internal and external capacity to further capitalize on our current projects and implement new solutions. Looking forward, we aim to invest in practical solutions that allow us to build on our current efforts and technological resources.

In the coming years:

- We aim to acquire an additional work boat to expand our capacity and reach on the Bay.
- We seek to expand our workforce to do the field work as well as fully utilizing our technological resources.
- We aim to establish a physical location on the water to serve as a home base for our field season and research work, allowing us to store, maintain and charge our boats, electric motor, multi-spectral drone and AUV and ROV safely and conveniently.
- We hope to create a laboratory space with state-of-the-art water quality analysis equipment and a collaborative space for staff and summer students and possibly provide a classroom setting for school field trips for children to learn about water, on the water.

As the scope of our work continues to grow, so do the demands that are required to support it. Only with your support have we been able to get to where we are today, and it's only with your continued support that Georgian Bay Forever will be able to continue to grow and work on your behalf to ensure a healthy and thriving Georgian Bay, forever.