

# GEORGIAN BAY **FOREVER**



FALL 2020  
VOL. 11, ISSUE 3

Protecting your water.

# WORKING WITH YOU FOR 25 YEARS

**“Every single moment on the Bay has been a memory competing to be number one. The race is still being run.”**

Geordie Dalglish and The W. Garfield Weston Foundation



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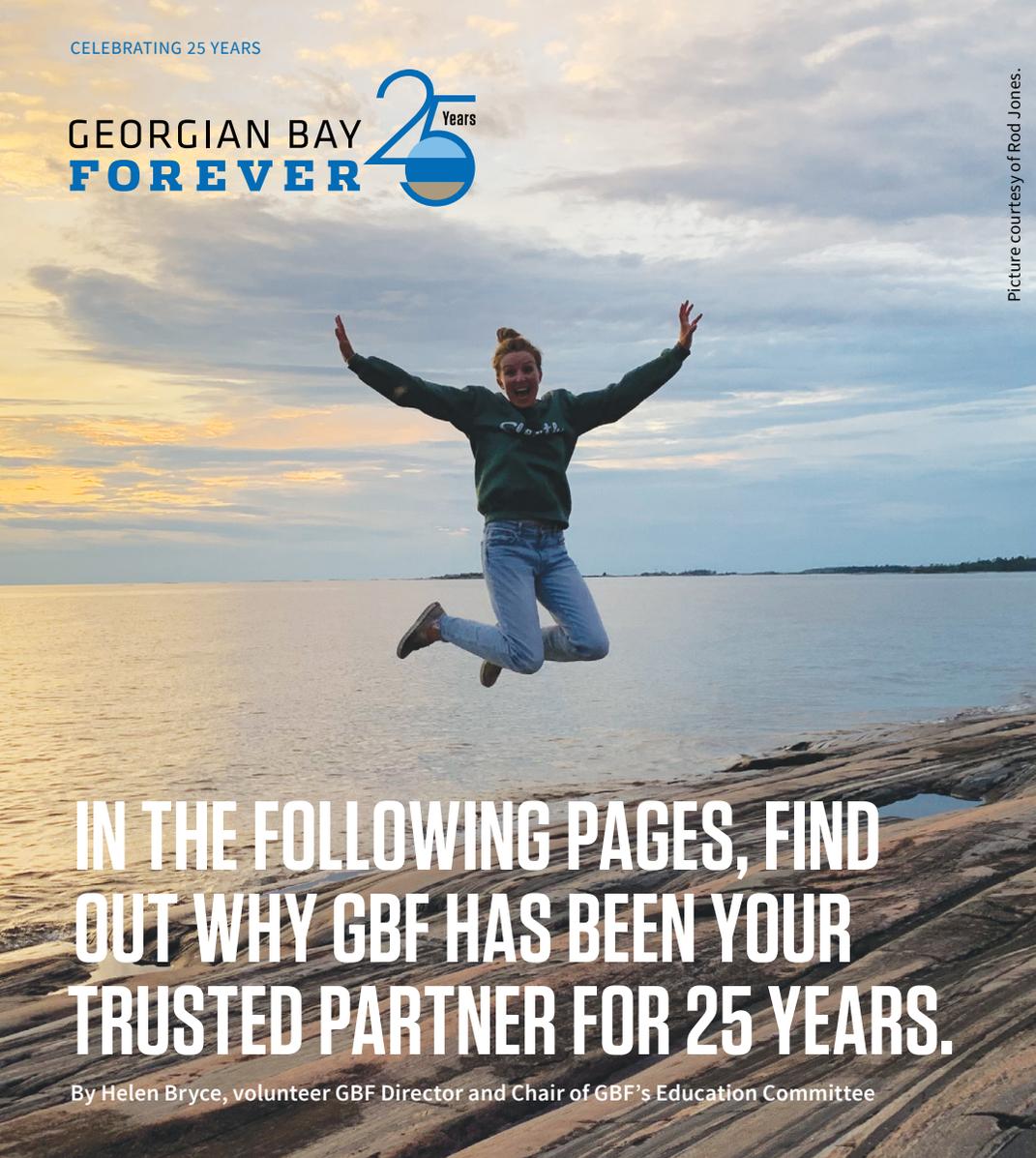
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Picture courtesy of Rod Jones.



# IN THE FOLLOWING PAGES, FIND OUT WHY GBF HAS BEEN YOUR TRUSTED PARTNER FOR 25 YEARS.

By Helen Bryce, volunteer GBF Director and Chair of GBF's Education Committee

Georgian Bay Forever has reached a significant threshold. We are 25 years old! To celebrate, we asked past and current board officers, municipalities, donors and partner organizations to reflect back on our accomplishments in Georgian Bay, their memories and to share their dreams about the future. You'll find their quotes throughout this newsletter and marked with a 25th logo. Please know we thank all participants! We received so much response that there were too many to print. We will be sharing them on social media and online over the Fall (including these comments from past Board officers at [bit.ly/25GBF](http://bit.ly/25GBF)).

To kick it off, we asked our current Chair and Executive Director to tell us what turning 25 means to them.

“A mere 25 years ago, people who love Georgian Bay saw the need to support significantly more science, research and related activity in order to protect the Bay and its waters. GBF continues that activity now and with the steadfast support of many (financial and “sweat” equity), we persevere. We look forward to working together over the next 25 years to protect the Bay for future generations — deep into the future eras and epochs.”

**Adam Chamberlain**, Chair.

“Celebrating a quarter of a century is an expression of the passion our Georgian Bay community have with our beloved Bay. Having the privilege of leading this organization to new heights over the past decade has given me the opportunity to work with our caring and generous donors and the numerous skilled and wise volunteer directors, committee members and staff. We have blossomed into an effective charity working for Georgian Bay and our Great Lakes waters.”

**David Sweetnam**, Executive Director.

Georgian Bay Forever is a community response to the growing need for major research and education to sustain the Georgian Bay aquatic ecosystem and the quality of life its communities and visitors enjoy.

We help monitor the Bay's well being, throughout the seasons, year after year.

We fund the research needed to protect the environmental health of Georgian Bay and the surrounding bodies of water. Using our research findings, we inform and educate the general public and governments about threats to environmental health and propose possible solutions.

Through workshops, seminars and online, we are educating the Georgian Bay community. By teaming up with reputable institutions, we enhance the credibility of our research and strengthen our ability to protect what's at stake.

Georgian Bay Forever is a registered Canadian charity (#89531 1066 RR0001). We work with the Great Lakes Basin Conservancy in the United States, as well as other stakeholder groups all around the Great Lakes.

Deeply rooted and broadly drawn, Georgian Bay Forever is steered by lifelong devotees of the Bay. We are committed advocates, educators, environmentalists, realists, idealists, and of course, residents.

## DIRECTORS

Helen Bryce	Doug Heintzman
Janet Burt	Neil Hutchinson
Adam Chamberlain, Chair	Anne Randell
Terry Clark	Joe Tucker
Paul Emond	

## EXECUTIVE DIRECTOR

David Sweetnam

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Canadian citizens may send their donations to the address above.

U.S. citizens wishing to make a donation to support our work can do so by giving to:  
Great Lakes Basin Conservancy  
PO Box 504, Gates Mills, OH  
44040-0504, USA

This newsletter is just a snapshot of our work. For the most up-to-date information on our projects, longer versions of newsletter articles and breaking news about Georgian Bay, please become a regular visitor to our website and Facebook page.

[GBF.ORG](http://GBF.ORG)

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# IT WAS A DIFFERENT SUMMER

By Adam Chamberlain, Chair of Georgian Bay Forever



Whether this was a summer to remember or one to forget is probably a matter of your point of view. Some of us spent extra time on the Bay due to COVID, many others could not get there at all. Then there were the record high water levels...

While we have family and friends on the Bay who live in the U.S., I didn't realize how many of our cottage neighbours live south of the border—until now. Driving by Tomahawk Island (north of Honey Harbour) in early July, I think all the cottages were still boarded up from the winter. I have always understood that the Tomahawk Club was a U.S. based group, the extent of its U.S. based membership was made plain by the border closure this year.

When things will return to a more normal state of affairs is unknown. Hopefully they will be resolved to a degree that allows our U.S.

neighbours to join us again in 2021. It will also be good to see other aspects of Georgian Bay summer life return. Regattas, cribbage tournaments, cottage association events, community get-togethers in addition to other group activities were sorely missed this year. We all look forward to a world where Zoom or Facetime are merely optional ways of attending, not the only way.

In the meantime, we look forward to continuing to interact with you in any way we can. Please watch for our "virtual" events this fall and through the winter. Please keep in mind that like other organizations, we are especially challenged this year to continue funding important projects for water protection. Your donation support is so deeply appreciated to keep protecting Georgian Bay for those future summers we are now looking forward to.

GBF's 25 years inspires this memory



"Some of my favorite memories of Georgian Bay have been on the water... fishing and fish fries with family and friends. When I was younger we would spend a lot of time in the boat while we listened to our grandmother and father on what it was like cottaging in Bayfield Inlet in the early years...by train to Pointe au Baril, then canoe, then later by car...as we made our way to their favorite fishing spots that the guides had shown them back in the 1950's... full of bass and pickerel. Now we are passing down the same traditions and stories to our children and grandchildren as we fish those same spots...plus a couple new hot ones!"

**Thank you John Carrick and Family,** McAsphalt Industries for sharing your memories and supporting Georgian Bay Forever.

# UPDATE FROM THE EXECUTIVE DIRECTOR

By David Sweetnam, Executive Director of Georgian Bay Forever



Just a very brief update to keep you aware of great progress during this unusual time:

- The Autonomous Underwater Vehicle, **Georgie McBayFace**, is on a mission in September for Environment Canada (see page 10).
- Our Phragbusting is going strong. Reporting is underway! Lots of areas have been eradicated and will revert to monitoring now and we have treated many areas we never got to in past years. Truxors were deployed in September in Tay Township.
- Microplastics (Divert & Capture) is rolling along as planned. Samples have been collected again and the U of T competed another Waste Water Treatment Plant sampling. We completed 16 shoreline clean-ups, and worked on measures to reduce litter from dock foam (see pages 4 and 5). Great work everyone during COVID physical distancing times!
- Seabins are being installed in Collingwood. We have educational signage going in too.

We have joined the Great Lakes Plastic Cleanup project (Council of the Great Lakes Region, Pollution Probe, Ports Toronto, Boating Ontario, U of T Trash Team) and will add our other locations to this project. Beacon and Desmasdon's marinas have joined us also.

- The GBA/GBF October Water Levels symposium, *Driving consensus on what to do about water levels in Georgian Bay* is proving popular. Register to join us at [bit.ly/Oct24WLEvent](http://bit.ly/Oct24WLEvent)
- We thank out-going directors Derek Bowen, Jennifer Ferguson, and Laren Stadelman for their outstanding volunteer efforts in guiding Georgian Bay Forever. Their efforts have greatly contributed to 25 years of protecting the Bay.

Just a small update, but important because these extraordinary efforts are underfunded for next year. Please know that your donations will make a critical difference.

"Congratulations to Georgian Bay Forever on 25 years of ensuring that Georgian Bay stays healthy. We are excited to collaborate with Georgian Bay Forever on an innovative plastics diversion project in the Collingwood Harbour."



**Thank you Town of Collingwood.** GBF has worked with the Town on *Phragmites* eradication, and is currently working on plastic "Divert and Capture" mitigation strategies, including installing Seabins, a type of vacuum for surface water litter, and collecting data on the litter's type and source.



Collingwood from the water.

# GAINING TRACTION ON SAYING “NO” TO DOCK FOAM

By Heather Sargeant, Communications Director for Georgian Bay Forever

Formed in the Fall of 2019, the Say “No” to Dock Foam Committee has made a lot of progress towards reducing and eventually eliminating unencapsulated polystyrene (PS) foam that is used to float many docks. The committee was formed because 13 cleanups in 2019 organized with the help of GBF, showed that foam was by far the most abundant litter picked up by 112 volunteers, and of that foam most of it was very visibly dock foam.

## In 2020, so many things have progressed on mitigating the source of this pollution

- **GBF promised and delivered a report, *Problems with Polystyrene Foam: Environmental fate and effects in the Great Lakes*** that brings together peer-reviewed scientific studies on the effects of PS foam on wildlife, and reports of where it has been littered (find it at: [bit.ly/PSFoamGBF](https://bit.ly/PSFoamGBF)). An excerpt of that report by Lisa Erdle notes, “PS foam can contain two types of chemicals: (1) additives and polymeric raw materials (e.g. monomers) originating from the plastics, and (2) chemicals adsorbed from the surrounding environment. Overtime, these chemicals can leach out of plastics and often these leachates can act as toxic or endocrine disrupting chemicals.



Say “No” to unencapsulated polystyrene foam used to float docks.

When ingested, PS microplastics pose adverse effects to wildlife. Laboratory experiments show negative impacts of PS on growth, survival, feeding and swimming behaviour, hepatosomatic index (HSI), and reproduction (Cole et al., 2015; Sussarellu et al., 2016; Qiang and Cheng 2019; Yu et al., 2018). Under certain conditions, PS foam leaches styrene, benzene, and ethylbenzene which have known toxic properties (Thaysen et al., 2018). The leaching of PS monomers is one of the reasons why there is greater concern with polystyrene relative to other types of plastic.”

- **Swap out your dock education.** With your support, the Committee met several times since Fall 2019 to gather information on alternatives to “open” or unencapsulated dock foam, and talked to one Parry Sound retailer who sold it, and promised to stop over the next 1 to 2 years. The committee’s aim is to educate consumers, retailers and municipalities about the pollution problems with unencapsulated PS foam for docks, and work to provide information on alternatives. To date, this information, combined with the report has been shared with community associations, GBF’s email list, the GBA, and in the Township of Georgian Bay’s newsletter. We have talked with representatives from the Township of Tiny, Collingwood, and of course The Township of The Archipelago (see next point). There are plans to talk to other municipalities. **To find the cumulated information on unencapsulated dock foam alternatives, please visit: [bit.ly/DocksPSFoam](https://bit.ly/DocksPSFoam)**
- **Removal from the market — partnership with the Township of The Archipelago (TOA).** TOA has been working on its own and in concert with GBF and the committee to mitigate PS foam pollution. In August, TOA arranged a meeting with the honourable MPP Yurek, Minister of the Environment, Conservation and Parks to discuss banning unencapsulated PS foam use for docks at the Association of Municipalities of Ontario virtual conference. GBF was invited to discuss the environmental effects of PS foam. While the government considers this information, GBF learned that the MPP from Parry Sound-Muskoka is also fully engaged in initiatives to mitigate this pollution. Back to TOA, in 2021, they will

present with GBF at the Great Lakes St. Lawrence Cities Mayors Conference and continue to work on how they can help assess and mitigate this problem with the help of community and cottage associations.

## There will be so much more to come.

We know this pollution problem has not gone away — this summer’s cleanup results to date show that. We all thank the volunteers who cleaned their shorelines and sent in the data — it becomes powerful evidence for driving change, and for cleaning up litter that mars the beauty of Georgian Bay and can be a risk for wildlife. GBF, the Say “No” to Dock Foam committee, TOA, the GBA, and passionate community/cottage associations will continue efforts to mitigate this pollution through education, policy, and cleanup efforts — and grow the coalition of concern and action. Furthermore, GBF has been working with the Council of the Great Lakes Region, their partners, and our partners to bring *Seabin* technology (like surface water vacuum cleaners) to select spots in Georgian Bay to collect even more litter, and increase the data on what litter is polluting our water so we can work to stop it. **None of this can be done without your care and support. Thank you.**

## GBF’s 25 years inspires this memory



“Georgian Bay Forever has been incredible to work with in our project investigating solutions to microfiber pollution. Through Georgian Bay Forever, we have been able to implement microfiber filters on over 100 washing machines. This collaborative research is teaching us a great deal about microfiber capture, and how to prevent microfibers from entering the Great Lakes. Georgian Bay Forever has been an invaluable resource for our research at the University of Toronto, and we are thrilled to have the opportunity to collaborate.”

### Thank you Lisa Erdle.

Lisa Erdle researches the effects of microplastics on animals that are part of a Great Lakes food web. The Rochman Laboratory is working with GBF to *Divert and Capture* microfiber/plastic pollution. GBF commissioned Lisa to work on the report, *Problems with Polystyrene Foam: Environmental Fate and Effects in the Great Lakes*.

“Georgian Bay Forever is a strategic partner of cottagers and municipalities applying science and sweat equity to identify and solve the dynamic challenges of this precious place we call Georgian Bay.”



**Thank you Township of The Archipelago,** partner on *Phragmites* and mitigating unencapsulated polystyrene foam litter from docks.



# TOP 5 LITTER ITEMS IN 2020

YOU DID 16 SHORELINE CLEANUPS, CLEANED 6310 M, AND PICKED UP 299 LBS. HERE WERE THE TOP OFFENDERS:

\*Submissions compiled as of August 24, 2020

TOP 5 ITEMS (combined cleanups)	RANKING: Residential shorelines (small household teams)	RANKING: Beaches, parks, trails (bigger teams)
Plastic pieces big and small (unidentified origin)	#1	#1
Cigarette butts	#3	#2
Food candy wrappers	#4	#3
Paper items	N/A (#5 styrofoam packaging)	#4
“Dock” foam – large and small pieces	#2	#5

## TAKEAWAYS

**Too much discarded plastic.** 60% of the litter items picked up were fragmented and degraded plastic pieces (source was unidentifiable to the naked eye). 10 million kilograms of plastic litter enter the Great Lakes each year. It's not easy, but we can all work towards choosing to refuse plastic products when we don't need them (e.g. straws), and/or find used plastic products (e.g.. buy used toys, or products made with recycled plastic), and/or choosing products that have less plastic packaging or a high percentage of recycled plastic.

**Properly dispose or secure potential litter so it doesn't end up in the water** (e.g.: cigarette butts, masks, bottle caps, wrappers, plastic gloves etc.).



Lots of BIG pieces of PS dock foam in a shoreline cleanup, photo courtesy of the South Channel Association.



Big pieces of unencapsulated PS Foam fragment into smaller and smaller pieces, littering the shoreline.

Please accept our sincere congratulations on this, the 25<sup>th</sup> anniversary of Georgian Bay Forever! We've been especially fortunate to have you as a partner in the *Divert and Capture* program — diverting microplastics from Georgian Bay and the entire ecosystem it supports. Thanks for your work in helping to preserve the life-giving waters of Georgian Bay — forever.



**Mayor Jamie McGarvey**, Town of Parry Sound  
Thank you Parry Sound. Parry Sound has partnered with GBF on a 2-year study to identify how many microfibres can be diverted from 100 household washing machines (spoiler alert — preliminary results indicate millions daily).



**Georgian Bay Forever thanks these funders and volunteers for their contributions to mitigating PS foam pollution, part of GBF's *Divert and Capture* project.**

This project was undertaken with the financial support of the Government of Canada through the federal Department of Environment and Climate Change Canada, the RBC Foundation, Patagonia, J.P. Bickell Foundation, The W. Garfield Weston Foundation, LUSH, The LeVan Family Foundation, The Charles H. Ivey Foundation, the Township of The Archipelago and GBF's many passionate donors.

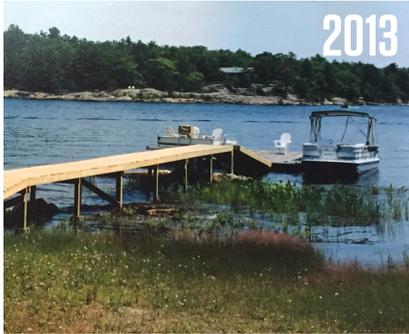
Our deep appreciation goes to the “Say No” to Dock Foam Committee comprised of staff and volunteers. Thank you especially to volunteers: Peter Adams, Stella Juhász, Erika Kramer, Sue McPhedran, Brenda Royce, Sandy Thompson. Thank you to GBFs Brooke Harrison and Heather Sargeant, and the University of Toronto's Lisa Erdle for their contributions. A final thanks to all the sellers, and environmental managers who provided information when interviewed.



# CAN WE GET OFF THE WATER LEVELS ROLLER COASTER?

## A JOURNEY TO UNDERSTAND CLIMATE CHANGE.

By Heather Sargeant, Communications Director for Georgian Bay Forever. Contributions to this article were made by David Sweetnam.



### The increasing range of L.Huron/ Michigan (Georgian Bay)

#### Record all time-high:

October 1986, 177.50 M or 582.35 ft.

#### Record all time-low:

January 2013, 175.57 M or 576.02 ft.

#### Variation Range:

1.929 M or 6.33 ft.

#### 2020 seasonal record-breaking benchmarks

As of the time of this writing, Lake Huron had exceeded its record high monthly levels for 8 months in a row (January to August).

#### Takeaways:

The range of water levels is increasing. This could impact your property. Register to join the GBA/GBF webinar, *Driving consensus on what to do about water levels in Georgian Bay* on October 24th to learn the latest from scientists on this topic. Register here: [bit.ly/Oct24WLEvent](https://bit.ly/Oct24WLEvent)

I used to love roller coasters. Not so much anymore, probably due to a combination of age and designs that aim for ever steeper hills and more corkscrews. Trying to be the fun parent, I still try the odd one, and exit the ride feeling very nauseous for a long-time.

Like a wild ride, this year's record-breaking high-high water levels and flooding, and the increasing heavy-precipitation storms soar over the recent memory of plummeting lows with stranded wetlands and navigational issues not that long ago — all leaving me feeling those same waves of nausea. But unlike the roller coaster coming back to the platform, as conditions become increasingly more risky, I am fearful that we can't get off this ride.

"Georgian Bay is a truly unique environment with about 90% of the world's fresh water islands, and Canada's richest home for biodiversity. It must be protected. Georgian Bay Forever provides that protection through advocacy and research, and therefore we believe that a donation to GBF is an excellent investment in the future of the Bay."



Thank you Doug and Ruth Grant, GBF Circle members.

### Can we make the water levels roller coaster safer? Should we?

Fluctuating water levels are innate to Georgian Bay — and important to its unique biodiversity.

What is different today is the "flashy" and rapid variability of water levels racing from record lows (2013) and now record highs (2020).

So let's look at the emerging forces. These "out-of-historical band" extreme water level changes are connected to the constant feed of greenhouse gas emissions (GHG-methane and carbon dioxide CO<sub>2</sub> are examples) that humans have been putting into the atmosphere. Not even COVID-19 shutdowns have made much of a difference to the world's ability to move towards the Paris goal of a 2°C threshold by 2100; that threshold established to prevent catastrophe. It's the world's challenge.

Professor Ralph Keeling (famous for the Keeling Curve showing the earth breathing) notes, "the buildup of CO<sub>2</sub> is a bit like trash in a landfill. As we keep emitting, it keeps piling up.

The crisis has slowed emissions, but not enough to show up perceptibly at Mauna Loa [where the measurements are taken]. What will matter much more is the trajectory we take coming out of this situation.<sup>1"</sup>

To protect Georgian Bay, it is GBF's mission to bring understanding around climate change, ask the questions that haven't been answered, and work with you and our partners towards solutions, adaptation and mitigation.

### Are diversions and man-made controls with regulation plans in the Great Lakes system driving the roller coaster?

These current measures do take a bit of the edge off, and could do some more, assuming current conditions somehow don't get worse, but they are certainly not driving the flashiness in the system. Something, and important — but not likely to be nearly enough to counter mother nature as the boundaries of water levels keeps reaching new records. More will need to be considered.

#### Learn more

Register to join the GBA/GBF webinar, *Driving consensus on what to do about water levels in Georgian Bay* on October 24th to hear from hydrological experts and policy makers on this topic. Register here: [bit.ly/Oct24WLEvent](https://bit.ly/Oct24WLEvent)

### What's behind the words "Climate Change" or "Global Warming."

Greenhouse gases get their name because these gases let the sun's rays through the atmosphere to warm the earth like insulation in an attic keep the heat from escaping. Now trapping some of that heat is good. Without greenhouse gases (GHG) in our atmosphere, the earth would be freezing and uninhabitable.

**BUT**, we're emitting so much more GHG, from our lifestyles, products and processes, and removing so many natural ways that GHG is absorbed and stored on earth, that more and more heat energy is getting trapped in our atmosphere instead of radiating out to space. We are amplifying the greenhouse effect and changing the earth's natural energy balance.

“Georgian Bay is Ontario's Rocky Mountains. For 25-years GBF has been a leader in not just protecting this watershed, but also an educator in helping all of us understand it's more than an outdoor playground. It's what sustains us.”



#### Thank you Patagonia.

Over the years, Patagonia has granted critical funds to support GBF's projects on eradicating *Phragmites* from Coastal Wetlands and to *Divert and Capture: The fight to keep microplastics out of our water.*

Increasing emissions of GHG are making our earth less and less liveable for many species, including *Homo sapiens*. It's getting hotter and hotter, and that thermal energy is transferring to hydrologic processes and ultimately impacting water levels in our oceans and Great Lakes.

Warming of the troposphere — the part of the atmosphere we live in — means there will be more water content in the atmosphere fuelling stronger storms and flooding.<sup>2</sup> To understand why, we need to understand a little about thermodynamics.

Warmer air can contain more water molecules as vapour.<sup>3</sup> Because of the higher heat energy, this vapour won't condense until meeting lower energy cold air. On average, for each 1.8°F (1°C) of warming the air can hold about 7 percent more water vapour.

#### So shouldn't this extra vapour just fall as rain in balance?

Only with magical thinking — if there was zero motion and air circulation, **rain** would increase at about 7 percent per 1°C of increased temperature.<sup>4</sup> On earth, air motion and atmospheric circulation are complex processes that drive **rain** distribution; and are themselves also impacted by global warming.

Clearly, knowing where and how much rain will fall are important to agriculture (food security), human safety in populated areas, and property protection; and that's just the human risk side.

Predicting this has never been a perfect science, but now old modelling tools are increasingly losing their ability to predict where, when, and how much rain will fall. Our way of life is getting riskier: globally, floods and extreme events now occur 4 x more often than in 1980 and in the Great Lakes Basin (including Georgian Bay) heavy precipitation events have increased 35% between 1951 to 2017.<sup>5</sup>

The insurance companies know this and they are developing all kinds of ways to reduce their own risks that are going to cost you more money to mitigate your own risk.

“When the insurance industry looks at extreme weather events, it's usually in terms of dollars. Between 1983 and 2008, catastrophic loss claims (meaning any claim resulting in over \$25 million worth of damage) averaged \$405 million per year. From 2009 to 2018 (inclusive), catastrophic losses cost insurers an average of \$1.8 billion a year, according to the Insurance Bureau of Canada.”<sup>6</sup>

#### A deeper dive into the mechanics behind increasing storm strength and climate change.

NASA defines storms as “atmospheric disturbances that redistribute heat and produce some combination of clouds, precipitation, and wind.”<sup>7</sup> There are many types of storms (hurricanes, ice storms, lightning etc.) and strength measures (wind speed, rainfall amounts etc.) — we'll focus on some basics.

A simple thunderstorm occurs when a mass of warm humid air is forced to rise by winds and/or raised terrain. In rising, the warm air expands because the pressure is lower the higher you go. The warm air cools and at some point, loses so much energy that the water vapour condenses to liquid/rain. The heat given off in this process of condensation is called latent heat, and as logic follows moves out of the vapour and heats up the surrounding air. The storm event begins to feed itself. The surrounding latent heated air will continue to rise. As it rises and expands, more condensation occurs and an updraft is created with lower air pressure below it and air rushing in to fill it. And if it's over water, that warm air will pick up more water vapour that also keeps feeding it.

“Working with GBF to keep our shorelines clean has been a blast! Helping to coordinate and unite people for a good cause is why we love GBF.”



#### Terra Voth, Environmental Steward

GBF enjoyed working with you and Tiny volunteers on reducing pollution and cutting *Phragmites* in order to protect shorelines and aquatic ecosystems.

#### That is a simple explanation of increasing storm intensity, but what about the role of global air circulation patterns.

There are studies that indicate that the global circulation of air is slowing (jet streams). Contributing factors are being studied such as diminishing sea ice and a warming Arctic region, themselves simultaneously being impacted by global warming.

Jet streams are bands of strong wind in the atmosphere that follow the boundaries of opposite air masses/pressures — between hot and cold air.<sup>8</sup> Often referred to as “rivers of air” with the strongest currents being in the middle, they blow from west to east in North America, but can bulge north and south and in some instances break apart/buckle with some parts going east to west for short periods. They can be thousands of miles long and wide, several miles thick, and can flow at a speed of 200 miles per hour.<sup>9</sup> The winds are so strong they push around other masses of air of different pressures (temperatures) creating storm zones, and are a large determinant of changes in weather. Their paths matter in terms of the weather you experience — if a jet stream passes over you more directly, expect whirling storms, if its north of you, you'll be in a warmer dry zone, if it is south of your location, you'll be generally on the cold polar side.

The jet that forms in the polar region flows at a lower height than other jets as it has more cold mass (heavier) bringing cold air with it from west to east across North America and then, starts to move northward in the Spring pulling the warmer air.

#### Jet stream paths have always varied and are a huge determinant of weather. How does climate change impact these rivers of air?

One paper by Dr. Jennifer Francis and Stephen Vavrus<sup>10</sup> argues that because the Arctic is warming faster than the tropics, the contrasts of temperature are less, slowing the jet stream, making its path wavier and creating more storm events. The stalling of the jet stream resulting from changes in the Arctic is projected to lead to many more prolonged extreme weather events by 2100. These projections vary depending on the different climate GHG model scenarios. Under a business as-usual carbon emission, a co-author of a Pennsylvania State University 2018 report noted that “a 50 percent increase is very likely and that's likely conservative.”<sup>11</sup> That's scary because it is our increasingly frequent experience. A quick review of what's happened in recent years indicates more extreme weather related events and effects; examples include Australia, California, and Alberta wildfires and European flooding (Venice 2018) that have been linked to the disrupted flow of the jet stream. And, we're certainly seen some wild weather and effects in Georgian Bay; examples include the 2018 Ontario fire season and the Parry Sound fire, flooding/high waves/strong winds wreaking havoc in many areas from Tay, to Wasaga Beach, to Parry Sound over the last couple of years.

One report by Boeak-Min Kim and others relates the polar vortex to the reduction of sea ice (much of it from man-made global warming) that has permitted more heat energy to escape, which weakened the jet stream allowing more cold air to escape south, potentially explaining some of the polar vortex winters that we had a few years ago.<sup>12</sup> Others posit that the tropical regions are heating up more quickly (at higher altitudes), widening, and therefore pushing/shifting up the jet stream a little, potentially making a wetter Europe and a dryer Mediterranean. To paraphrase Tim Woolings, an associate professor in climate science, we don't know for certain what the impacts are on the jet stream, but it's clear we should continue to try to figure it out — as we continue to be vulnerable to increased temperatures and moisture in the air that a jet stream will push around in its meandering path.<sup>13</sup>

GBF asked previous GBF chair Peter Singer what he saw as the organization's greatest achievements during his term.



“During my time, the organization evolved from being an offshoot of the GBA to the expert in matters related to the waters of the Bay. This generated recognition from organizations and provincial and federal governments. The ability to be ‘at the table’ meant that GBF was able to meaningfully influence future policies affecting the Bay and Great Lakes.”

#### Thank You Peter Singer.

Peter Singer was a volunteer board officer with GBF from 2015 – 2017, and served as Chair. The Singers are part of Georgian Bay Forever's Circle, whose members have donated more than \$15,000 over their lifetime.

The Georgian Bay Association (GBA) is a critical partner of Georgian Bay Forever, and the separation in 1995 allowed GBF to focus on scientific research and education around environmental protection. The two organizations constantly collaborate.

GBA wishes our partner GBF a very Happy 25<sup>th</sup> Birthday! Congratulations on your growing strength over the years providing a first class resource on science and education for all of Georgian Bay.

We greatly value GBF's scientific input into our advocacy work, and look forward to many more future collaborations on mitigating extreme water levels, climate change impacts, and pollution to help protect our beloved Bay.



Rupert Kindersley,  
Executive Director GBA

## How does this all affect extremes in water levels?

I have only scratched the surface of natural and human factors that impact water levels and the influences of climate change and its relations to the distribution of water that is increasing in the atmosphere. There are so many more interrelating factors — what happens when the Basin is saturated by so much precipitation (longer to drain out), how is evaporation factoring into water levels and how are seasonal temperature shifts affecting evaporation (eg. the 2019 winter was very wet, like in October when usually a lot of evaporation would have occurred<sup>14</sup>), what about increased water temperatures, how are seasonal temperature shifts impacting the types of precipitation (rain, snow etc.) and how do all these relate to each other; are some further topics.

Even with much more to learn, there are two key takeaways, best expressed by research scientists Dr. Drew Gronewold and Dr. Richard Rood, “as researchers specializing in hydrology and climate science, we believe:

1. Rapid transitions between extreme high and low water levels in the Great Lakes represent the ‘new normal’.
2. And, more importantly that, “past conditions around the Great Lakes are not a reliable basis for decision-making that will carry into the future.”<sup>15</sup>

### Back to the roller coaster.

I started off by talking about wanting to get off the extreme roller coaster of water levels in Georgian Bay. What I have realized is that the water levels are a smaller roller coaster ride piggy-backed on the even crazier monster roller coaster of climate change. We can start to make the smaller ride safer by looking specifically at shoreline adaptation measures and working with officials to see if further adaptations or manmade interventions are possible to practically trim more on the extremes of the emerging new normal, but to make a significant difference we must also be really focused **over the next 10 years** on making the bigger roller coaster of climate change more safe by 2100.

## Resources and Actions

### Discovery (learning)

1. Watch GBF's Executive Director's Webinar/Video recording — *Water Levels. What's Going On* to get an overview of all the complex factors driving water levels. [youtu.be/3C54Lp8-t\\_0](https://youtu.be/3C54Lp8-t_0)
2. Take the next step! Join the conversation with GBF and the GBA. Register for: *Driving consensus on what to do about water levels in Georgian Bay*. A 4- hour online event featuring hydrological experts in science, engineering and policy. The aim is to drive consensus towards actions that can mitigate the extreme ups and downs on water levels in Georgian Bay. More info and register here: [bit.ly/Oct24WLEvent](https://bit.ly/Oct24WLEvent)

### Actions

3. Shoring up your shoreline. Stabilize your shore by planting native vegetation — the deep roots will help the land from breaking apart during heavy rains and winds. The Georgian Bay Biosphere Reserve has several native plant recos here: [gbb.ca/conservation-guides/#&gid=1&pid=2](https://gbb.ca/conservation-guides/#&gid=1&pid=2)
4. Watch the 1/2 hour video at [bit.ly/GBFresiliency](https://bit.ly/GBFresiliency) to hear David Sweetnam, GBF's Executive Director talk about various ideas on making your cottage more climate resilient.
5. Some tips on reducing your GHG emissions. Reduce your food waste, eat less meat and more local vegetables. GBF article here: [bit.ly/GBFPlantDietTips](https://bit.ly/GBFPlantDietTips), and move to electric vehicles, and/or travel less.

- 1 theguardian.com/environment/2020/jun/04/atmospheric-co2-levels-rise-sharply-despite-covid-19-lockdowns
- 2 From [agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2012GL051000](https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2012GL051000) that CITES - Meehl, G. A., et al. (2007), Global climate projections, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report*
- 3 [climatesignals.org/climate-signals/atmospheric-moisture-increase](https://climatesignals.org/climate-signals/atmospheric-moisture-increase), Clausius–Clapeyron equation
- 4 [earthsky.org/earth/frank-wentz-will-global-warming-bring-more-rainfall](https://earthsky.org/earth/frank-wentz-will-global-warming-bring-more-rainfall)
- 5 [glisa.umich.edu/gl-climate-factsheet-refs](https://glisa.umich.edu/gl-climate-factsheet-refs), these stats represent part of the complex picture emerging of more variability and extreme water levels in Georgian Bay
- 6 [lowestrates.ca/blog/homes/climate-change-home-insurance-going-to-cost-you](https://lowestrates.ca/blog/homes/climate-change-home-insurance-going-to-cost-you)
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- 10 [agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2012GL051000](https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2012GL051000)
- 11 Projected changes in persistent extreme summer weather events: The role of quasi-resonant amplification
- 12 [globalnews.ca/news/1541651/global-warming-melting-sea-ice-connected-to-polar-vortex-study/](https://globalnews.ca/news/1541651/global-warming-melting-sea-ice-connected-to-polar-vortex-study/)
- 13 [independent.co.uk/news/science/climate-change-crisis-latest-jet-stream-extreme-weather-a9208901.html](https://independent.co.uk/news/science/climate-change-crisis-latest-jet-stream-extreme-weather-a9208901.html)
- 14 [chicagotribune.com/suburbs/evanston/ct-evr-cb-lake-michigan-water-levels-explainer-tl-0806-20200730-la4g4pbgff-ca7f6hdif47sf7u-story.html](https://chicagotribune.com/suburbs/evanston/ct-evr-cb-lake-michigan-water-levels-explainer-tl-0806-20200730-la4g4pbgff-ca7f6hdif47sf7u-story.html)
- 15 Dr. Drew Gronewold, Associate Professor of Environment and Sustainability, University of Michigan, Dr. Richard B. Rood, Professor of Climate and Space Sciences and Engineering, University of Michigan.



# MEET THE THOMPSONS WHO COTTAGE AT PORTAGE ISLAND, COGNASHENE

By Amber Gordon, Director of Development for Georgian Bay Forever

Life is so abundant in and around the unique ecosystem of Georgian Bay that it is almost impossible not to encounter numerous species every single day. This is one of the most fervent reasons why the Thompson's, comprised of Rob and Val, daughter Sandy, son Ken and his wife Myka Campbell and their three kids, Keeley, Jeremy and Simon, love the cottage on Georgian Bay more than any other place in the world.

The Thompsons are all avid watchers and, when possible, photographers of all the many creatures around their cottage and the Bay. They have long-standing visitors like “Toad” who lives in the deck flowerpot and the many hummingbirds that return every year, to provide the family with mating dance performances, and who occasionally dive bomb anyone on the deck when they interrupt this ritual!

As anyone who experiences the Bay can relate to, the natural environment with its wide-open spaces and virtually endless views of the water makes a lifetime impression and the same holds true for the Thompsons. Having been on the Bay for several generations they have experienced a multitude of life changing moments and sacred family memories.

At the young age of two, Rob was introduced to the Bay when his family rented a cottage at Go Home Bay. They loved the area and the cottage so much that they bought it 2 years later. That cottage is still in the family today! One of the most memorable events that Rob recalls of his early time on the Bay, was of the whole family trying to make it to the cottage one dark and stormy Thanksgiving night when the boat motor conked out. They were stranded,

bouncing in the choppy waters off Red Rock in the dark. Everyone tried everything to start the motor thinking “is this the end?” until someone “owned up” to the fact that they had just turned the key off!

Val remembers her first time experiencing the Bay which was not long after meeting Rob in a crowded bar during the Calgary Stampede in 1967, when he struck up a conversation over a cold, frothy beer. It was love at first sight, as the saying goes! Soon after this chance encounter, they married and spent part of their honeymoon in Ireland and part of it at the family cottage at Go Home Bay. Coming from England, Val was used to the open sea, rocks, trees, and beaches. So, to her, “The Bay felt like home from the moment I laid eyes on it.” Just over a year later, Rob and Val welcomed their first child Ken and then in a year and a half, their daughter Sandy. Living in Calgary at the time and then moving west to Vancouver, Rob and Val didn't get back to Georgian Bay often until they moved to Toronto in 1979. The Thompsons began getting to know Georgian Bay by renting cottages until they purchased their cottage on Portage Island in Cognashene in 1984. Some of the most memorable moments of the whole family's time on the Bay involve picnics on American Camp, boat trips to Henry's for the world-famous fish and chips, camping at Hurontario (for Rob and Ken) visiting their relatives, and experiencing other parts of the magnificent landscape they have come to love.

For each of them, the Bay is their home and ensuring the essence of their home is retained is extremely important — maintaining pure, clean water; protecting and promoting

naturalized shorelines; and, ultimately, just encouraging and developing a respect for nature in general. Rob, Val and Sandy give back through volunteering on local boards and groups, including the Cognashene Cottagers Association, Cognashene Church and the Georgian Bay Association to name a few. Ken and Myka, being based in the US, don't have quite the same opportunities to support the Georgian Bay community as the rest of the family, however, they are heavily involved in their kid's sports teams down south.

## PRESERVING GEORGIAN BAY IS A LIFELONG PASSION FOR MEMBERS OF THE THOMPSON FAMILY.

Supporting projects and organizations, like Georgian Bay Forever and other members of the GB4, both financially and through hands on work, are ways they further their passion. They believe in supporting organizations working to prevent water pollution, fighting shoreline erosion caused by extreme fluctuations of high-high and low-low water levels, climate change impacts, and ensuring our wetlands are healthy and not being decimated by invasive *Phragmites*. Preserving and providing the space to experience nature at its finest for their kids, their three grandkids and all their aquatic and terrestrial friends, is why the Thompsons have supported Georgian Bay Forever for over 22 years! And according to the Thompsons “There is no place like home”... and we couldn't agree more!

# GEORGIE MCBAYFACE IS ON A MISSION

By David Sweetnam, Executive Director of Georgian Bay Forever



One of the benefits of working in Georgian Bay is working in Georgian Bay. Gazing out across the beautiful shimmering surface of our Bay is a splendour that we are privileged to experience while others only dream of tales of such magnificent and abundant fresh water. Imagine walking for hours each day just to get a jug of turbid silty suspicious water for your family to survive.

Protecting our Bay is a task requiring that we monitor stresses to the Bay, and who is better suited to that task than Georgie McBayFace — our yellow, torpedo-shaped autonomous underwater vehicle (AUV).

Georgie came to Georgian Bay through a partnership between three Universities — Western University, University of Waterloo, Wilfred Laurier University — and Georgian Bay Forever. Dr. Brian Branfireun (WU) and Dr. Heidi Swanson (UW) had a dream to improve water quality testing in northern Ontario and Canadian lakes experiencing impacts from climate change and they applied for funding to support the purchase of an AUV. Their version of the AUV would have been a bare-bones model that would do the rudimentary sampling. As the date to spend the funds came to a close, Dr. Branfireun decided to type AUV into the internet search engine to see the latest news in the AUV world.



To find more information about what the Autonomous Underwater Vehicle (Georgie) can do, please visit [bit.ly/AUVSensors](https://bit.ly/AUVSensors).

funding to support what would also have been a bare-bones AUV platform. But because we had this campaign on-line — and our search engine optimization perfected — it was one of the first things to pop-up on Brian’s screen. And that serendipitous discovery was the start of a beautiful friendship.

GBF and the Universities pooled our available funding and were able to purchase a fully instrumented and upgraded AUV to share — spring and fall in Georgian Bay and after the arctic lakes melted in the summer the unit would travel north with the University researchers.

can frequently be too choppy or stormy and therefore unsafe for a small surface vessel like our Baykeeper boat.

This year, because of COVID-19, the University research programs have all been put on hold. That has meant that Georgie has been in the careful custody of GBF all year. This has allowed GBF to experiment with this technology, test its capabilities and to learn how to properly program, deploy and maintain the instrument in the field.

As we deploy Georgie we are creating and cataloguing missions. These missions are basically the pathways Georgie follows while collecting data. These missions only have to be created once and can then be identically repeated in future years thereby allowing us to build a detailed understanding of the water over time. Year after year, Georgie will diligently repeat these missions allowing us to see if there are any changes occurring in our water. And those change detections will allow us to take the appropriate actions to protect our Bay.

## GBF’s 25 years inspires this memory



“Georgian Bay Forever has reached an amazing milestone — 25 years. I am honoured to support an organization that uses sound scientific research to battle the threats against our beloved Georgian Bay water. GBF is an organization that is not afraid to push the boundaries and invest in state of the art projects to protect our pristine waters. The waters that my family and I have enjoyed for generations and will continue to enjoy for many more. Congratulations, GBF on your 25<sup>th</sup> anniversary.”

**Thank you Michael McCain.** Your support over so many years has enabled so many important water protection projects.

Georgie is initially being deployed to help us map the lake-bed in a project for Environment Canada and as a partner in a Great Lakes wide international effort called Lakebed 2030 — where the entire Great Lakes lakebed will be mapped in high-resolution by a consortium of teams by the year 2030. This mapping is very important for scientists to be able to create a detailed computer/digital model of the lakes so that simulations of various stresses can be analyzed and impacts anticipated.

The coastline of Georgian Bay is a convoluted and globally unique archipelago that collectively has more coastal miles than the rest of the Great Lakes combined, so this project is a daunting task. Georgie makes this process much more efficient by being able to work below the surface of the water — waters that

“The purchase of the Autonomous Underwater Vehicle, in partnership with several universities, was unanimously supported by the Board. Its use will revolutionize water quality testing in Georgian Bay, while providing many other opportunities for science based research.”



**Thank you Anne Randell.** Anne Randell served as GBF’s volunteer Chair from 2017 to 2019. She has also been a long-time donor to GBF, and an even longer Pointe-au-Barilier.



## GEORGIAN BAY FOREVER 25 Years

“Nottawasaga Valley Conservation Authority’s Education Department has truly enjoyed a collaborative connection with Georgian Bay Forever, as we develop hands-on programming to inform on water quality issues, which highlights the importance of their work.”

**Thank you NVCA.** It’s been a pleasure to work with you over the years on *Phragmites* eradication and on plastic litter mitigation.

“Georgian Bay Forever’s commitment to hard work, sound science, and community engagement inspires us in our work. Georgian Bay Forever is skilled at taking science and bringing it to the community, which puts our scientific findings from research into practice. The action Georgian Bay Forever has taken on microplastics, including polystyrene foam and microfiber initiatives, will no doubt have a positive impact on Georgian Bay and beyond.”

**Thank you Dr. Chelsea Rochman.** GBF is honoured to work with a leader in understanding the sources, fate and ecological implications of synthetic chemicals and microplastics, in freshwater and marine ecosystems.

“What a wonderful milestone to celebrate! Georgian Bay Forever provides leadership on critical issues of ecological research and stewardship in one of the world’s unique ecosystems. Your vision and work advances the scientific and educational mandate of UNESCO World Biosphere Reserves and we are proud to partner with you on long-term protection of this very special place. Congratulations GBF on your first 25 years of achievements!”

**Thank you Dr. Rebecca Pollock,** Executive Director of the Georgian Bay Biosphere Reserve (GBBR). GBF is always proud to work with the GBBR on several projects to bring important water projection data to the public, and on projects that help clean shorelines and safeguard biodiversity.

**GBF asks: As you watch your children and grandchildren grow and enjoy cottage life, what would you like to see GBF accomplish over the next 25 years to protect Georgian Bay?**

“Wide scale collaboration with affinity groups to develop the public consensus needed to pass bi-national public policy mitigating the impact of climate change and the expanding population on the Great Lakes eco system.”

**Thanks Lloyd Posno,** GBF Director from 2004 – 2010, and served as Chair.

“We support GBF for its adherence to scientific evidence and promoting programs based on that evidence. There is an alarming degradation of our planet’s biosphere. While the health of all the planet concerns us, our focus is doing what we can to preserve our own precious resources, for the benefit of future generations. We believe GBF is an excellent organization that accomplishes much with very few resources.”

**Thank you Frank and Patricia Mills.** Your support continues to fund water quality projects from baseline data gathering on water quality to active volunteer programs that work to restore shorelines.

“GBF is vital in protecting our water and environment – currently exemplified by its fight against *Phragmites*. Our family is passionate about the Bay and appreciates the dedication and effort of GBF led by its Board.”

**Thank you Larry Ward.** GBF Director from 2009 – 2012, served as Treasurer.

“My family has fond memories of the Bay and we are bonded to it. We see Georgian Bay Forever as part of the effort to preserve the Bay.”

**Thank you Gail Regan** for your generosity and love of the Bay.

“GBF dedicates all of its efforts to understanding the threats to the Bay and educating the public and the various government entities about what needs to be done to combat them. For this precious corner of our planet, GBF is our best hope to protect it. After more than 60 years on this Bay, I think it is worth it. Those of our generation who love Georgian Bay are its current stewards. I sure hope my grandchildren and great grandchildren can enjoy it as much as we do and that, in time, they will become its stewards too.”

**Thank you Rod and Joanne Jones,** long-time GBF supporters. Rod has previously served on the GBF board.

“Georgian Bay is a complete escape. Every single moment on the Bay has been a memory competing to be number one. The race is still being run. We like to support great work. It’s a plus when that work involves Gbay.”

**Thank you Geordie Dalglish and The W. Garfield Weston Foundation.** Your support enables significant protection work.

**GBF asks: What was GBF’s greatest achievement during your term as a director of GBF?**

“We began applying scientific rigour to GBF’s mission and built relations with numerous domestic and cross border leaders and organizations in the Great Lakes Region to ensure that GBF would have the necessary influence to protect the Bay for future generations.”

**Thank you Brenda Drinkwalter,** GBF Board Director from 2010 – 2015, and served as Chair.

# GBF IS PLEASED TO RECOGNIZE THE MEMBERS OF THE GEORGIAN BAY FOREVER CIRCLE

Honoring our loyal supporters for their cumulative donations of \$15,000 or more to March 31<sup>st</sup>, 2020.

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Using the enclosed envelope, send in your donation today!

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