GEORGIAN BAY FOREVER

Protecting your water.

WINTER 2019
VOL 10, ISSUE 1

WATER LEVELS, WATER QUALITY AND ECOSYSTEMS

INSIGHTS FROM H_2O 2018

AUV PURCHASE MULTIPLIES CAPABILITIES!

By David Sweetnam, Executive Director

2019 has come and we are already embarking on perhaps the most exiting year in the history of Georgian Bay Forever. Not only is our invasive *Phragmites* eradication program starting to pay off (we have seen a 23% decline in Honey Harbour), but we have entered an exciting new partnership with the University of Western Ontario, University of Waterloo and Wilfred Laurier University to acquire a state-of-the-art water quality tool.

The Autonomous Underwater Vehicle (AUV) is a torpedo-like submersible that has a cluster of water quality detectors on its nose and side-scanning sonar and Doppler sensors along its torso. This computerized, robotic tool can be pre-programmed to follow a precise three dimensional underwater track to a depth of 100 metres to give us the most accurate measurements ever of our precious Bay.

This instrument platform can run on its own for up to ten hours at 2.5 knots capturing over 300,000 measurements during each run including temperature, oxygen, water colour and clarity, chlorophyll, blue-green algae and pH. The AUV will collect almost 500 gigabytes of sonar imaging and data including flow rates of the water it travels through.

Our team will plan out the schedule for this revolutionary capability annually. It will be used by Georgian Bay Forever in Georgian Bay and by the University researchers in the Canadian far north. GBF is extremely excited by the unprecedented monitoring and science resources we are bringing to Georgian Bay, and the research partnerships with three major Canadian universities arising from this collaboration. Thanks to everyone who has contributed to this exciting new capability.

ENVIRONMENTAL PRINTING

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Georgian Bay Forever (GBF) is pleased to announce we have changed printers.

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We are so excited to work with Warren's and **thank the Georgian Bay Association's John Carson** for the introduction to this partner.

Environmental calculator: By using Cocoon Silk paper rather than a non-recycled paper, the environmental impact was reduced by:

11,021 LITRES OF WATER

38 KG CO_2 AND GREENHOUSE GASSES

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GEORGIAN BAY FOREVER

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.

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You can reach David Sweetnam, our Executive Director, at ed@gbf.org or at 905-880-4945, ext 1.

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

Design by Key Gordon (keygordon.com)
Editor: Heather Sargeant

Follow us on

MESSAGE FROM THE CHAIR

By Anne Randell, Chair

Seems like yesterday it was Y2K, and now here it is 2019! Time passes so quickly and so much is changing on all fronts—climate, technology, innovation, and much more. This constant change makes the work of Georgian Bay Forever that much more important as we strive to ensure that the pristine waters of our beautiful Georgian Bay remain that way for the next generation… and the ones after that…in fact, forever.

It is a challenge though, and that's why we believe that our research and science efforts, focussed on water quality, water levels and invasive species, are so important.

You will read elsewhere in this issue about our recent joint purchase of an AUV (Autonomous Underwater Vehicle) which will revolutionize water quality testing and other research possibilities in the Bay (page 2). You will meet our newest Board Member, Helen Bryce, who is heading up the GBF Education Committee below. And you will learn about the many topics presented at our recent H_2O 2018 educational conference (page 4). Please take the time to watch the various video clips (go to gbf.org) of some of the excellent topics if you can.

I am pleased to share that we were successful in reaching our fundraising goal in 2018, raising almost $500,000 from generous and caring individuals, groups and businesses. Our critical work is only possible with support like this and we appreciate each and every contribution. As well, we appreciate the many volunteer hours contributed by our Board and Committee Members as well as the 290 community volunteers who have helped with our fight to eradicate invasive *Phragmites.*

Thank you one and all for your help and support. We couldn't do it without you!

Photo courtesy of Anne Randell.

NEW FACES AND A NEW COMMITTEE!

GBF welcomed Helen Bryce to the board of directors as the Education Director and chair of the new Education Committee last summer. Helen is a fourth generation Pointe au Baril cottager who brings her passion for the Bay and her experience as a school administrator to the task.

This new committee has been charged with the clear purpose to generate compelling educational offerings that foster appreciation, care and action to protect Georgian's Bay aquatic wildlife and the quality of its waters.

The Education Committee's first challenge was organizing the H_2O 2018 October info session in Toronto, which was co-hosted with the Georgian Bay Association and sponsored by Bruce Power. Expert speakers spoke on topics that impact your water including climate change, microplastics pollution, invasive *Phragmites*, and aquaculture. Participants who were surveyed online gave the over-all information presented at H_2O a 93% mark! **Now, you get a chance to discover or re-visit the important points from the session in the following pages.**

Members of Georgian Bay Forever's new Education Committee at a January meeting. From left to right: Heather Sargeant, David Sweetnam, Helen Bryce (Chair of the committee), Paul Emond. Other members include: Amber Gordon-Bunn, Anne Randell, and Jennifer Ferguson.

We're looking for committee members and we welcome your ideas and feedback. Please contact Helen via email at **info@gbf.org** with the subject line Education Committee to join us and make a difference!

INSIGHTS FROM H_2O 2018

By Jennifer Ferguson, Chair of the Communications Committee of Georgian Bay Forever.

It was a startling, stimulating and sobering day for the 104 people who attended Georgian Bay Forever's (GBF) October 2018 H_2O educational event, co-hosted this year by the Georgian Bay Association (GBA) and sponsored by Bruce Power.

The event was startling because we learned that we are literally eating and drinking our own trash. It was stimulating because we learned so much and quickly realized that we have so much more to learn. Lastly, it was sobering because we learned that climate change is upon us and that it's up to all of us to act **NOW** to avoid environmental catastrophe.

UPDATE FROM THE IJC

Kicking off the day was **Gordon Walker, Canadian Section Chair of the International Joint Commission (IJC)** and a long-time cottager in the Cognashene area. Established in 1909, the IJC provides advice and recommendations to both the American and Canadian governments with respect to achieving the objectives laid out in the Great Lakes Water Quality Agreement (GLWQA – 2012). These objectives pertain to conservation, remediation, protecting human health, reducing pollutants, combatting invasive species and responding to climate change in the Great Lakes.

According to Commissioner Walker, the overall health and drinking water quality of Lakes Huron/Michigan is good. However, fish populations and ice coverage have both declined and surface water temperatures have increased.

In coming decades, the key issue will be phosphorous levels. According to Commissioner Walker, the IJC is concerned about increasing nearshore nutrient inputs that contribute to the risk of algae blooms that threaten to contaminate our fresh water supply. The IJC is also increasingly mindful of the effects of microplastics and invasive *Phragmites* — an issue he credits GBF with bringing to the fore.

"A lot of us have a very direct Georgian Bay connection. And what is Georgian Bay, some people call it the Sixth Great Lake."

— Commissioner Gordon Walker

CLIMATE CHANGE — WE MUST ACT NOW

Consistent with recently released reports, Dr. Shannon Carto, a Policy Advisor with the Environmental Commission of Ontario, confirmed that we are 0.5 degrees Celsius (°C) away from environmental catastrophe. Dr. Carto spoke to the need for all of us to act now if we want to change the ending to the current climate change story.

"I never thought I would live to see the impacts of climate change" she said. "But, as scientists the world over have recently confirmed, climate change is moving faster than we are. We are the last generation that is capable of doing something about it."

The growth in atmospheric carbon dioxide (CO_2) levels over the past 250 years is mostly attributable to the burning of fossil fuels through human activity. The readings of CO_2, a greenhouse gas, passed the 350 parts per million (ppm) mark in 1988 and reached 409 ppm in August 2018. Climate disruption may be irreversible beyond 350 – 400 ppm. "We need to cut greenhouse gas (GHGs) emissions as much as possible as soon as possible," Dr. Carto said.

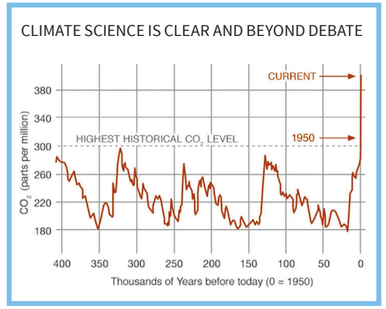
Rising CO_2 emissions are causing the Earth to warm up, and the rate at which the Earth is warming has accelerated dramatically over the most recent decades. As the Earth's temperature rises, our climate changes. And, Ontario is warming faster than the global average: the Earth's temperature in the Georgian Bay area has gone up 1.5˚C since 1948 compared to a 1˚C degree increase for the entire planet.

Oceans play a huge role in moderating the effects of global warming by absorbing 93% of the heat created in the atmosphere. However, the rate at which oceans can absorb heat is slowing down. Furthermore, as oceans absorb more CO_2, acidity levels rise in a process called ocean acidification that is killing coral reefs and many of the fish and vertebrates that rely on them for food.

As our planet heats up, we are seeing more and more extreme phenomena around the world. A few examples from 2018 include:

- Extreme and deadly heat waves in Europe, Asia, Canada, Australia, and the U.S.
- For the first time ever, temperatures reached 30˚C at the Arctic Circle.
- The warming of the north and south poles resulted in the smallest amount of sea ice extent on record in the Arctic and the second smallest in Antarctica.

Other extreme events that are on the rise include devastating wildfires, torrential rainfall and large-scale flooding as well as more severe storm activity and increasing drought conditions.



From Dr. Carto's presentation, courtesy of the Environmental Commissioner of Ontario

GOVERNMENTS ARE STRUGGLING TO IMPLEMENT EFFECTIVE POLICY.

IT'S UP TO ALL OF US TO ADOPT BEHAVIORS TO SAVE THIS PLANET.

Paris targets are out of reach unless we act much more and now! Efforts need to be tripled to not reach 2˚C, and quintupled to stay below the 1.5˚C target.

"Pathways reflecting current NDCs (Nationally Determined Contribution) imply global warming of about 3°C by 2100, with warming continuing afterwards. If the emissions gap is not closed by 2030, it is very plausible that the goal of a well-below 2°C temperature increase is also out of reach."

— The November United Nations *Emissions Gap Report of 2018.*

ONTARIO AND THE GREAT LAKES ARE NOT IMMUNE TO CLIMATE CHANGE

Over the past several years we have had hotter summers with more tropical nights, milder winters with more rain and less ice coverage on the Great Lakes. There have also been changes in plant and animal ranges and spawning cycles. The province now has the **highest number of Lyme disease** cases in Canada as the disease-carrying ticks migrate northward at a rate of about 12 – 15 km a decade according to Public Health Ontario.

Significant changes and fluctuating extremes in our weather are costly both in terms of dollars and human lives. Two of eight 2018 examples from Carto's presentation included extreme rainfall in south-western Ontario that led to extensive flooding and displacement of thousands of people that cost insurers more than $40M, and hurricane force winds (>100 km/h) in the GTA last spring that cost more than $380M. Distressingly, data attributed more than 70 deaths in Quebec to a prolonged heat wave in June that Ontario also experienced but uses different criteria to report.

Furthermore, in the 1980s, scientists started to notice these changes to the world's largest lake system, the Great Lakes basin:

- rising air and water temperatures;
- milder winters and hotter summers with more extreme rainfalls;
- increasing summer evaporation rates and declining ice coverage; and
- falling water levels — even though levels have rebounded since 2013, the long-term trend is heading downward.

While there are some "benefits" to these changes, there are also significant drawbacks: while the boating season may be getting longer, the ice fishing season is getting shorter. Low water levels and less ice coverage are damaging shorelines, beaches and wetlands that help maintain water quality and serve as spawning grounds for aquatic life. Without protective ice cover, winter storms result in fewer fish eggs surviving to hatch in the spring. Flashier, more intense storms bring more nutrient-rich run-off and flooding that can damage property and infrastructure, erode coastlines, and increase phosphorous levels resulting in nuisance and toxic algae blooms.

Water temperatures in the Great Lakes are expected to rise between 1˚C and 7˚C within the next century making our lakes more favourable for invasive species. There are currently more than 200 non-native species in the basin that can kill off native species, disrupt the food web, degrade habitat and introduce parasites and disease.

Warmer water also affects fish: both warm and cold water fish have moved northward at a rate of about 12 – 17 km a decade over the past 30 years, and this trend is expected to continue. Dwindling ice coverage during the winter puts plankton and fish eggs at greater risk. Greater lake stratification means less turnover of the water in the spring, which, in turn, creates dead zones in the productive, lower levels of the lakes where oxygen supplies have been depleted.

THE TIPPING POINT

In view of these and other changes to our environment, the question becomes: is it too late to turn back the clock and stop the deleterious effects of global warming? According to Dr. Carto, and the United Nations we have about 10 – 12 years to significantly reduce greenhouse gas emmissions (GHG) to avoid massive disruptions to our ecosystems and way of life.

As the second top polluter in the country, Ontario was well on its way to helping Canada deliver on its commitment under the Paris Accord to reduce CO_2 emissions to 30% of 2005 levels by 2030 with the cap-and-trade program introduced in April 2017.

> "Economists and scientists agree that putting a price on carbon is the most effective way to bring down GHG emissions."
>
> — Dr. Carto

Last fall, Ontario's newly elected government cancelled the program and replaced it with its own plan to combat climate change, a plan Environment Minister Rod Phillips says still aims to meet the targets set out in the Paris Accord. We can hope that's true, even though the environmental commissioner has said it is only 1/3 as ambitious as the plan it replaced. The government also has eliminated the independence of the Environmental Commissioner's office as a watchdog for GHG emissions in Ontario.

We as individuals can step in where our governments are floundering to save our homes, our country, our planet and the future. According to Dr. Carto, many of the actions required to reduce CO_2 levels are underway but they need to be accelerated. "Our choices, right now, matter. Every action matters."

THINGS YOU CAN DO:

1. Change how you get around. Buy an electric vehicle, car-pool, bike or take transit. Find out why electric cars are viable at: **https://www.plugndrive.ca/electric-vehicle-discovery-centre/**
2. Reduce your meat consumption. Eating 1 kilogram of beef contributes the same emissions as driving 176 kilometres with a combustible engine. As a comparison, 1 kilo of eggs is equivalent to 31 kilometres. Find the graph of more food types at: **https://www.cbc.ca/news/technology/food-climate-change-carbon-footprint-1.4930062**
3. Advocate for more protected land and programs that conserve forests, wetlands and ecosystems. Join and support GBF's fight for coastal wetlands. Learn more at: **www.gbf.org/invasive-phragmites**

THE MYSTERIES OF MICROPLASTICS

Last fall, Georgian Bay Forever embarked on an exciting new project in partnership with Dr. Chelsea Rochman and the Town of Parry Sound, to *'Divert and Capture'* microfibres from the town's wastewater. The two-and-a-half year pilot project is largely funded by an EcoAction grant from Environment and Climate Change Canada.

Professor Rochman is an Assistant Professor in the Department of Ecology and Evolutionary Biology at the University of Toronto. She spoke at H_2O about her passion for reducing plastics that get into our waterways.

It all started in 2006 when she read an article by Kenneth Weiss of the LA Times. The piece was about an island of trash in the North Pacific, known as the Eastern Garbage Patch that is twice the size of Texas. The article earned Weiss a Pulitzer Prize and prompted Dr. Rochman to go and see for herself this startling phenomenon.

"Looking at the surface of the water on a calm day, I noticed that most of the stuff was tiny bits of microplastics less than 5 mm in diameter," she told the audience. "And I thought, the small stuff could really be worse because it has the opportunity to contaminate every level of the food chain. And the reality is, that it has," she said.

Microplastics (< than 5 mm) come from a variety of sources, are found in many shapes, forms and sizes, and typically contain a variety of different contaminants. From discarded plastic containers to synthetic microfibres found in clothing and upholstery to microbeads used in personal care products, microplastics are global contaminants that could become even more dangerous through their absorption of hazardous chemicals like PCBs, pesticides, flame retardants and other toxic substances we have put in their surrounding environment.

Microfibres are among the most common type of plastic found. They are in our oceans — on the sea floor, the surface and everywhere in between. They are also in the soil, atmosphere and in our lakes and streams says Dr. Rochman. And, they are in our seafood and drinking water. **"We are literally eating and drinking our own trash,"** Dr. Rochman said.

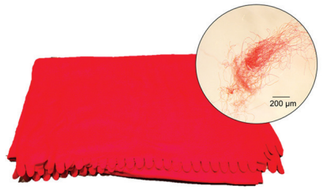
Recent studies conducted by Dr. Rochman and her students and colleagues found that most nearshore fish in Lake Ontario contain microfibres: anywhere from 1 to 20 or 30 fibres per fish. They were also found in 100% of offshore fish in Lakes Huron and Ontario. In fact, almost 97% of microplastics found in Rainbow Smelt and Lake Trout were microfibres — up to 70 microfibres per fish.

Research teams tested drinking water from different treatment plants in Lakes Erie, Huron and Ontario and found about 12 fibres and three fragments of plastic per litre of finished drinking water, the water we drink from the tap.

So where do these contaminants come from? A variety of sources, including cigarette butts, textiles, upholstery, wet wipes and **laundry**. A 2011 study was the first to draw a link between microfibres and laundry lint. Turns out that fibres from both natural and synthetic fabrics, as well as all the chemicals they contain, are released during washing and end up in our water treatment system.

While our heroic water treatment plants get rid of most of them, up to 40% of these fibres end up in aquatic habitat (Hartline et.). At more than 4 million microplastic particles per facility per day, microfibres are the most abundant microplastic found in Toronto wastewater treatment plants.

Based on a back-of-the-envelope calculation, Dr. Rochman estimates that between 23 and 36 trillion microfibres are emitted each year into Toronto's waste water from washing machine effluent. That's when she turned her attention to mitigation strategies and testing two different ways to trap microfibres before they escape down the drain and into our wastewater.

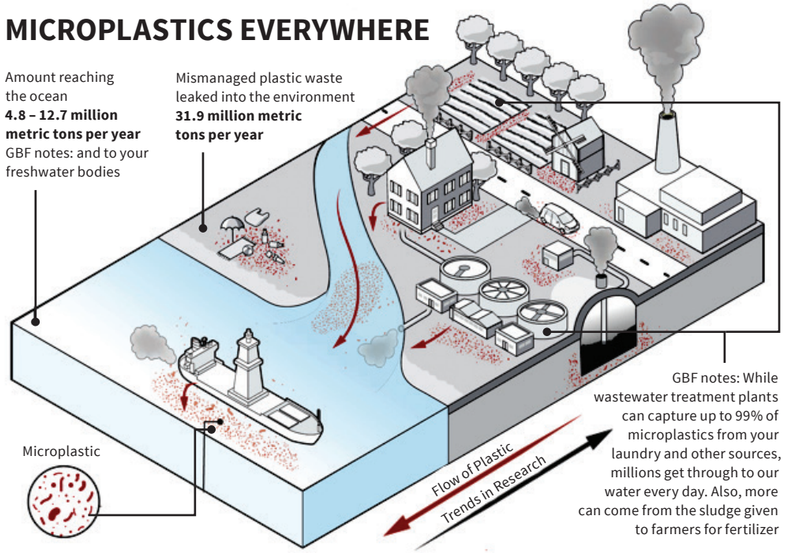


Plastic microfibres are released from this synthetic blanket during laundering. **Go to gbf.org to find out about washing machine filters.** Photo courtesy of the Rochman Lab.

Filters, that can be attached to washing machines to capture microfibres before they are released into wastewater, came out on top. Dr. Rochman's lab studies showed that filters could reduce microfibres released during washing by 87%.

And that's where Georgian Bay Forever and the municipality of Parry Sound come in. In collaboration with Dr. Rochman's lab, we are conducting a larger scale trial of the filters to see if we can capture and divert microfibres from entering the waters of Georgian Bay by installing 100 or more of them on washing machines in Parry Sound households. With the help and cooperation of Parry Sound's wastewater treatment plant staff, we'll monitor differences in microfibre levels in the town's treated water over the next couple of years. →

MICROPLASTICS EVERYWHERE



Courtesy of the Rochman Lab.

The work has the potential to inform future regulations regarding the manufacturing of washing machines and dryers, and whether these household items should come equipped with filters to reduce microfibres in our water.

In closing, Dr. Rochman said that little work has been done to date to understand the impact of microplastics on wildlife. Some studies suggest that microplastics can change or stunt growth, alter feeding habits and increase mortality in some species. "But," she said, "we really have no idea what the impacts of these contaminants are on humans."

Visit gbf.org/microplastics-impacts to find out more about microplastics, how you can reduce microfibre pollution, and support GBF's project.

GBF THANKS THESE *DIVERT AND CAPTURE* SUPPORTERS

This project is undertaken with the financial support of the Government of Canada through the federal Department of Environment and Climate Change.

Ce projet a été realisé avec l'appui financier du gouvernement du Canada agissant par l'entremise du ministère fédéral de l'Environnement et du Changement climatique.

Further funding and assistance for *Divert and Capture: The fight to keep microplastics out of our water*, was provided by the RBC Foundation, Patagonia, the Helen McCrea Peacock Foundation, and our many passionate donors.

GBF wishes to acknowledge the support of these partners:

The Rochman Laboratory at the University of Toronto, the Town of Parry Sound, the Georgian Bay Biosphere Reserve, the Ontario Ministry of the Environment, Conservation and Parks, and our many community volunteers!

GBF will continue to fundraise approximately $50,000 a year for this project that will allow us to expand its education and reach.

GROWING AN ARMY OF PHRAGBUSTERS

Communications Director, Heather Sargeant, kicked off this segment of the program on invasive *Phragmites*. She spoke about the work GBF has been doing for the past 6 years building Phragbusting capacity to help volunteers and community leaders around the Bay.

It's an ongoing offensive, one that has removed over 100,000 kilograms of the invasive with a growing army of municipalities, committed leaders, community volunteers, partners and donors up, down and around the coast.

Invasive *Phragmites* is one of the most destructive non-native plants to have infested Ontario. Originally from Europe, the reed grows quickly into tall, dense and impenetrable walls that literally choke the life out of our wetlands. Once established, invasive *Phragmites* threatens biodiversity, damages infrastructure, reduces natural habitat and impairs access to the water.

Last year, GBF employed 9 students to work with communities cutting Phrag on eastern and southern Georgian Bay coasts, assembled a team that helped The Massasauga Park, and engaged large tracked Truxor cutting machines to start the process of recovering Lily Pond in Honey Harbour, a provincially significant wetland overtaken by *Phragmites*. Partnerships and funding are key to the success of this project and GBF is thankful for all the support from donors, volunteers, and governments. Several partners spoke about their experiences.

Sue McPhedran, a member of the Woods Bay Association and a founding member of the Friends of The Massasauga Park, told attendees about GBF's and the GBA's Phragmites Network. The Network is an informal alliance of like-minded citizens and cottagers who come together to learn and support one another by bringing concerns forward in order to find solutions. GBF has played an instrumental role in educating residents and cottagers alike, she said, about how to identify invasive *Phragmites*, as well as how and when to cut it to minimize regrowth.

We also heard from Cate Root, a Councillor in Tay Township, about that area's ongoing commitment to rid the Township of invasive *Phragmites*. Root explained how the support of Tay Council, GBF and the Severn Sound Environmental Association, and some provincial funding helped to remove 10 stands found in 6 different public parks along the southern coast of the Bay. It takes an ongoing effort, she said, but since the program began in 2016, we restored several beaches and parks in the area that can now be enjoyed Phrag-free. In addition to municipal properties, the Township has a line item in its annual budget for community *Phragmites* eradication.

The 'Phrag queen of Honey Harbour', Kathryn Davis, also spoke about her Phragbusting adventures. She first noticed the tall grass on her property in 2010. "At first, I tried to get rid of it myself," she said. "I did all of the things that I now know you shouldn't do." And sure enough, the resilient invader kept coming back, bigger and stronger every year.

In 2014, Davis attended a demonstration GBF was giving to the Board of her cottage association. She has been active in developing a successful program with GBF to manage the fight against Phrag in Honey Harbour that has become a model for other communities.

PHRAGBUSTERS
WWW.GBF.ORG

Join the fight to help protect coastal wetlands in Georgian Bay by eliminating invasive *Phragmites*.

Learn more at gbf.org/invasive-phragmites.

NET-PEN AQUACULTURE IN GEORGIAN BAY — SHOULD WE BE CONCERNED?

An overview was provided of the known science and global, local, and industry views of net-pen aquaculture by a panel of speakers comprised of Jim Bolton for the Georgian Bay Association, R.J. Taylor from the Ontario Aquaculture Association and Dr. Neil Rooney from the University of Guelph (U of G).

Every presenter shared a great desire for a truly sustainable industry and a great love for Georgian Bay. In this writer's view, the biggest differences in positioning between the members of the panel were different ways to cautiously approach mitigating risk to the environment. GBF invites you to gain a greater understanding of the impacts and risks by putting yourself in each of these organization's 'shoes' and watching their video presentations and their responses to audience questions at **gbf.org/aquacultureviews.**

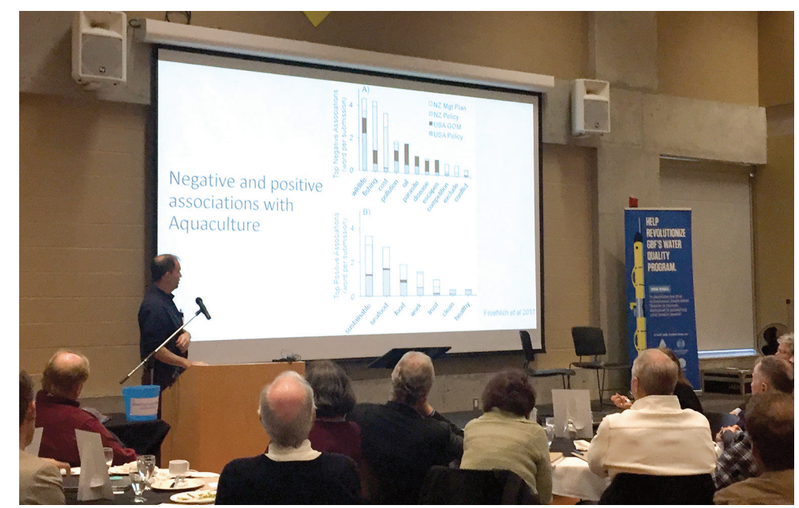
What will be summarized here is Dr. Rooney's presentation on the current context of aquaculture research and recent freshwater science.

Dr. Rooney started his presentation by providing a global and local assessment of aquaculture: where it is growing and why. It is a source of protein for a global population that is expected to reach 9 billion by 2050. A study was cited showing that much of the world views aquaculture positively in terms of sustainability and food security. In Europe, 93 percent of fish consumed is produced in farms. Conversely, Canada has the most negative sentiments towards aquaculture. Canadians' concerns with aquaculture are water quality and wild fish impacts including food or waste subsidies to wild stocks, escapee effects, spread of pathogens, and pharmaceutical use (Jan 2005).

Given the concerns, what recent science is available to us on freshwater that can help us figure out what management practices are best for aquaculture? There is some completed and ongoing research into examining a key concern for regulators around the phosphorus inputs from net-pen aquaculture. There is a risk that the waste and feed from fish farming could contribute too much phosphorus and lead to poor water quality as famously demonstrated in the 1970's in the Experimental Lakes area. Dr. Rooney took us through some 2005 research (Podemski et. Al.) that simulated a net-pen aquaculture operation and its organic phosphorus subsidies (more similar to fish food than the inorganic 1970s phosphorus experiment). The 2005 experiment did not show the soupy green water quality results of the 1973 experiment, and seemed to benefit some open water fish like Lake Trout.

Dr. Rooney then explained the steps in research that are being undertaken and analyzed by U of G with GBF support in an actual net-pen operation in Georgian Bay to determine if those same 2005 results can be found; noting that there is ongoing research to test multiple sites in Georgian Bay to understand variability. Ultimately, results could show negative, neutral, or positive impacts of nutrient subsidies from net-pen aquaculture, or vary depending on site location and operation.

To see his 21 min. presentation and learn more to support this research, please visit **gbf.org/net-pen-aquaculture.**



Top photograph: Aquaculture Panel from left to right: Moderator from GBF, David Sweetnam; Panel, RJ Taylor form the Ontario Aquaculture Association, Jim Bolton from the Georgian Bay Association, and Dr. Rooney from the University of Guelph
Bottom photograph: Dr. Rooney presenting a global and local assessment of aquaculture.

TOP 5 TAKE-AWAYS FROM H2O 2018

1. Scientists the world over have proven that global warming is upon us and that we only have 10–12 years to change course before the effects of climate change become irreversible.
2. Individuals and municipalities need to take serious action now in the face of larger governmental insecurity on implementing effective policies such as putting a price on carbon emissions. Examples of actions that can be taken now include buying electric cars and enacting local energy efficient by-laws and policies.
3. The impacts of climate change on Georgian Bay will be extensive and include rising water temperatures; changes to the food web, lower water levels over the long-term; loss of wetlands and the species who depend on them; shoreline erosion; the increasing risk of new invasive species; and wilder weather patterns.
4. We are eating and drinking our own garbage in the form of microplastics that are potentially chemical-laden and that have been found through out the Great Lakes waters and fish. Plastic pollution reduction requires a willingness by individuals to change every day consumption habits.
5. More research is needed to understand the impact of net-pen or open cage aquaculture in freshwater lakes and how to manage the potential consequences in order to feed people.

Want more? Find the full video presentations from H_2O 2018 at **gbf.org/h2o-2018-videos**

Thank you to Bert Liverance for his help filming and editing the videos.

Thank-you to the speakers, audience and these partners from H_2O 2018.

Bruce Power
GEORGIAN BAY FOREVER
GEORGIAN BAY ASSOCIATION

A CALL TO ACTION

By Amber Gordon-Bunn, Director of Development for Georgian Bay Forever.

Looking ahead into the future, I am scared. Scared for my children and their children. Scared because climate change is happening faster than anyone expected and we are almost out of time to stop the effects; microfibres are entering our waters, being ingested by our aquatic species or found in our beer and tap water at an alarming and increasing rate; invasive species seem to be everywhere along our coasts and roadways. I am scared for the health of the water that has been such a big influence in my life.

But, I am also hopeful. Hopeful, because I am a member of a team of 100s, if not 1,000s in our Bay communities and even beyond our own coastal borders, who are doing all they can to mitigate these looming threats. I am convinced that EVERY POSITIVE ACTION, no matter how small or insignificant it may seem, will have an effect on our Earth's precious resources and its ability to heal itself. I know that without our efforts to thwart *Phragmites* and divert microplastics/fibres, our cause would already be lost. If every small act can make a difference, think what we can do together, if we all take action NOW! Action can take on many forms — it can be volunteering to cut *Phragmites*, hosting a workshop, sharing communications or installing a filter on your washing machine. It can be joining our Board or one of our public committees dedicated to tackling big picture problems and helping to provide solutions to the numerous threats we face. And of course, taking action can be supporting those efforts financially through annual or monthly giving or by providing a bequest in your will. However you are able to take action, we implore you to start now! Time is running out to help save our freshwater resources.

TOM FITZGERALD

MAKING THE BAY A BETTER PLACE

By Amber Gordon-Bunn, Director of Development

Every once in a while, if you are lucky, you meet a kindred soul. Someone who believes in the same things as you do — like making the world a better place, protecting natural resources for future generations and doing it all without being asked! Our little team here at Georgian Bay Forever has been so fortunate to find such a soul in Tom Fitzgerald, owner of Bin City based out of Victoria Harbour.

Having been lucky enough to grow up on the shores of Georgian Bay, and spending most of his time at his parents' waterfront campground, Caswells — a love of Georgian Bay and it's water are part of his heart and soul. As so many of us can relate to, Tom truly feels that there is nowhere in the world he is supposed to be but on the shores of Georgian Bay. So, when he had an opportunity to expand his expertise in the "bin" business and, as he laughingly put it "bet on myself rather than someone else", he became his own boss, opening Bin City, located in Victoria Harbour, in April of 2018.

Although only fresh in the business, Tom is already giving back to his community, in a big way! After seeing the devastating effects of *Phragmites* on the property at Caswells, and attending a GBF sponsored workshop on this invasive reed, Tom and his Dad decided they had to support an organization working on ridding the coastal wetlands of this terminator-like plant. Together, they decided to generously donate the use of the Bin City bins, as well as covering all of the disposal fees to GBF in our quest to Fight the Phrag in and around the area of Tay and Tiny.

This busy "Jack of all trades" gives credit for his common sense, strong work ethic, integrity, ambition and sense of civic responsibility to his parents. "Having watched them work hard my whole life, and give back what they could to the various causes in the community, helped me realize that I needed to carry on their tradition and follow in their very big footsteps," Tom said when asked about why he chose to become a sponsor of the Small Business Program at GBF. "I love the water, love the peace and joy I feel when I look out over its shimmering surface during a sunset from my favourite spot behind the family "lookout". I love Georgian Bay because it gives life to many animals on this earth, which is the reason I would like to help protect it for the generations that follow."

Tom, we thank you for your kindness, for volunteering your bins, for giving of your time and your manpower to eradicate *Phragmites* from the shores of Georgian Bay. We applaud you for helping to ensure that the water of Georgian Bay stays pristine for the seventh generation to come after you. We wish you success in your endeavor and look forward to continuing our partnership for as long as it takes to eradicate *Phragmites* from Georgian Bay!

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