GEORGIAN BAY FOREVER

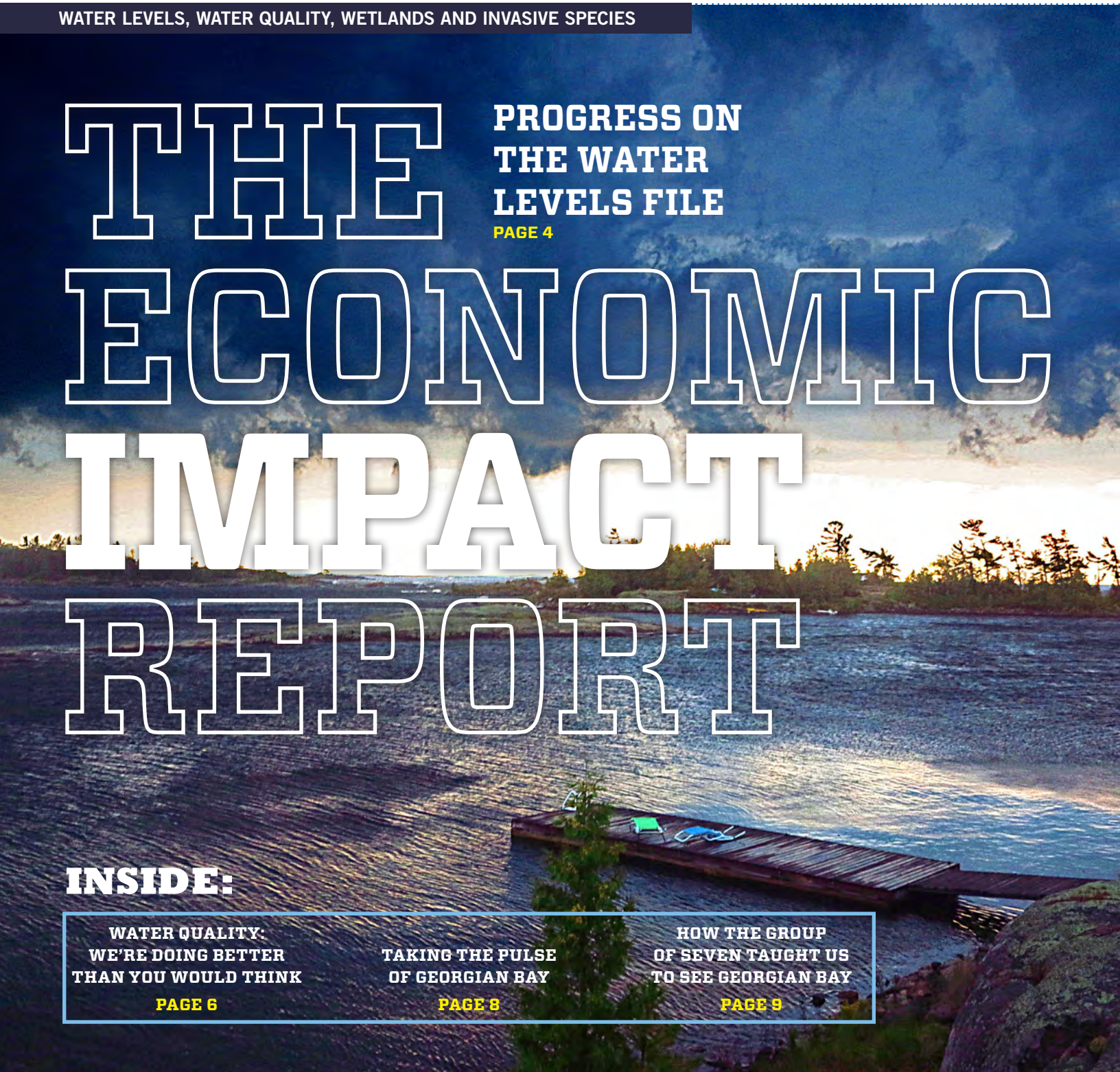
AUTUMN 2013
VOL 4, ISSUE 3

WATER LEVELS, WATER QUALITY, WETLANDS AND INVASIVE SPECIES

THE ECONOMIC IMPACT REPORT

PROGRESS ON THE WATER LEVELS FILE

PAGE 4



INSIDE:

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AUTUMN 2013

Photo credit: Penny Pepperell

GEORGIAN BAY FOREVER

Georgian Bay Forever is a community response to the growing need for major research and education projects 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 any threats to environmental health and propose possible solutions.

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

Georgian Bay Forever, formerly the GBA Foundation, 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.

Executive Director
David Sweetnam

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You can reach David Sweetnam, our Executive Director, at executivedirector@georgianbayforever.org or at (905) 880 4945 ext 1.

U.S. citizens wishing to make a donation to support our work can do so by giving to:
Great Lakes Basin Conservancy
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(Please add a note saying: "For Georgian Bay Forever")

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 on breaking news about Georgian Bay, please become a regular visitor to our website and Facebook page.
GeorgianBayForever.org

Design by Key Gordon (keygordon.com)
Editor: Penny Pepperell

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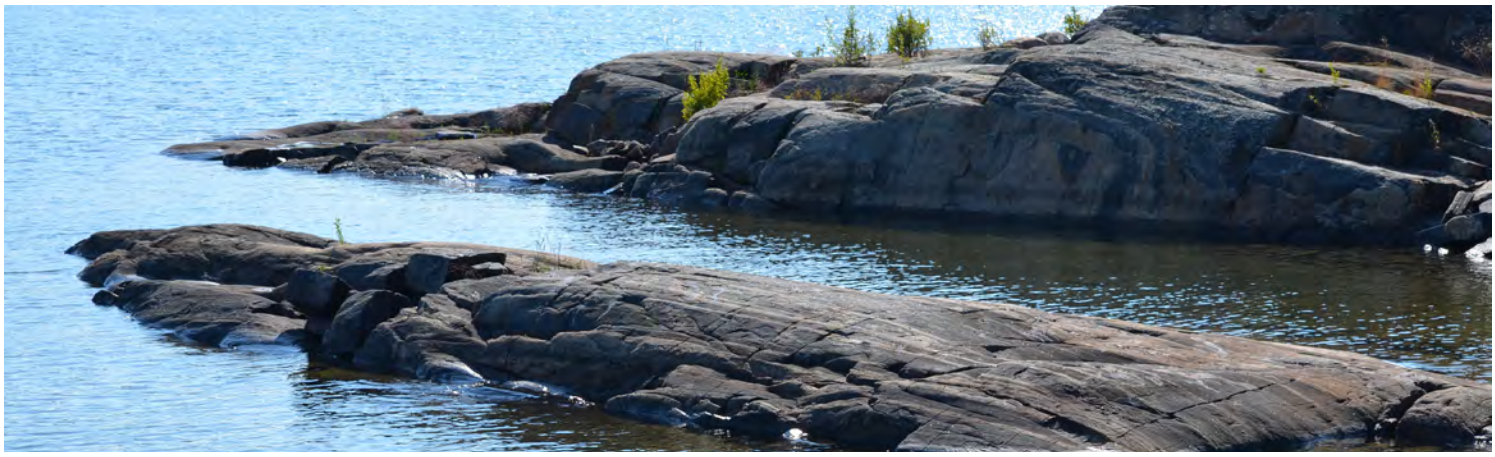
A storm on Georgian Bay, August 25, 2013.
Photo credit: Barbara Nettleton, Sans Souci

THE SUMMER OF 2013 BODES WELL FOR SUCCESS ON THE WATER LEVELS FILE

By Brenda Drinkwalter



Lake Michigan-Huron continues its longest stretch of below-average levels since 1918. While cooler temperatures and more rainfall accounted for a slight rebound this past summer, without structures to help manage the system, climate change will continue to wreck havoc with lake levels in the years to come.

This is the message that Georgian Bay Forever has been delivering to shoreline groups from Kincardine to Manitoulin, to all levels of governments, to sectors that are impacted by low water levels such as shipping, and to the IJC Commissioners. (New Canadian Commissioner Gord Walker who is also a Cognashene cottager will be the keynote speaker at our Vital Signs event on October 26th.)

Forever is recommending a careful study of ways to address the impacts of human interventions e.g. historic dredging in the St. Clair River as well as a study of the options that might mitigate the effects of climate change—drought, reduced ice cover and flashier storms. Possible locations for structures, either alone or in combination, plus modern water management technologies (structures that would allow levels to fluctuate and that won't disturb contaminated sediments) should be considered. In short, a system-wide approach is needed to prevent high highs and low lows.

We are very pleased with the progress of the economic impact study that we are working on with our partners, the Council of the Great Lakes Region and the Mowat Centre. The steering committee is impressive, being made up of multi-lake, multi-sector, cross-border stakeholders, including representatives from the U.S. Army Corps of Engineers, the shipping industry, hydropower, the Georgian Bay Association, and the AFL-CIO, among others.

GBF has been awarded a four year Lake Simcoe Eastern Georgian Bay Clean Up Fund Grant from Environment Canada. More to come on that in future issues.

You will see new faces on and some departures from the Georgian Bay Forever board and its committees. We are delighted to welcome Pointe au Baril cottager, Anne Randell, former president of the William Osler Health System Foundation to our board. Janet Burt (Manitou) has joined our Governance Committee as an expert in organizational design as we build out our volunteer organization. Penny Pepperell, (Sans Souci) and Michael Perley, (Bayfield Nares) have stepped down from the board. We thank both of them profusely for their significant contributions to Forever!

And to all of you who have supported Georgian Bay Forever's work, a huge thank you. This summer we have added new patrons, and are well on the way to funding the economic impact study. Forever is in it for the long term and with your support, we are more optimistic than ever before that we will be able to protect the Bay for our kids' kids' kids.

We are very pleased with the progress of the economic impact study that we are working on with our partners.

The Council of the Great Lakes Region Undertakes an Economic Impact Assessment of Declining Water Levels in the Great Lakes – St. Lawrence Region

By Matthew Mendelsohn

The Council of the Great Lakes Region (CGLR) is a new, bi-national regional organization spearheaded by the Canada-U.S. Law Institute at Case Western Reserve University in Cleveland and the Mowat Centre at the University of Toronto, along with many of the region's key organizations, including Georgian Bay Forever.

The Council works to enhance regional collaboration and cross-border integration by bringing together stakeholders from the private, public, and not-for-profit sectors to advance effective, coordinated, and broadly-shared responses to the region's common challenges.

To achieve its goals, the Council connects actors across the region to one another, informs decision-makers and the public about the region's interests, promotes the region's prosperity and sustainability and cultivates a strong regional voice.

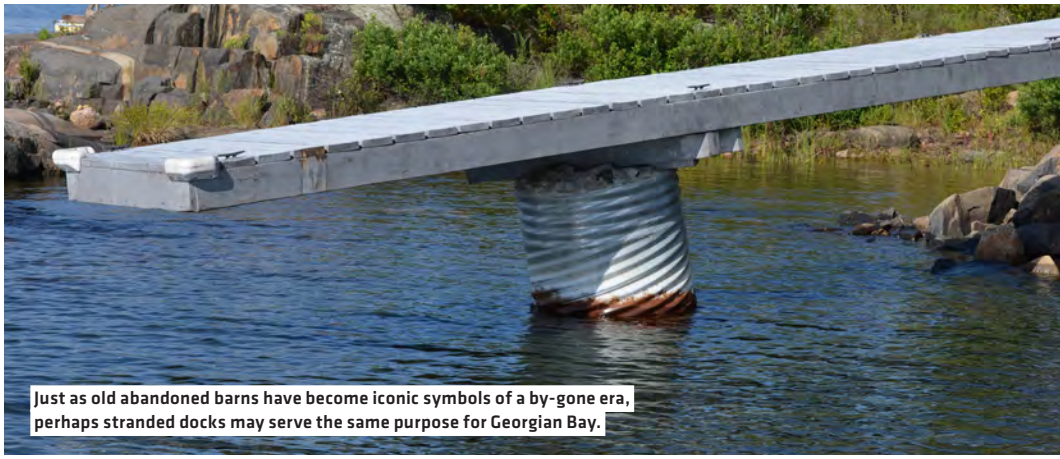
The Council's mandate is to work with our many excellent regional organizations, especially on water management and the environment, and to support their projects, as needed. But until now, no one organization has spoken for the region's interrelated long-term economic and environmental interests.

One of our most urgent challenges is declining water levels in the Great Lakes. CGLR is turning to this issue as one of its first priorities.

With the support of Forever and others, CGLR is undertaking a major economic impact assessment of declining water levels. Quantifying these impacts would provide key information to the public and decision makers to support planning and potential interventions in response to evolving water levels.

> "In the Great Lakes Region, environmental issues, like water levels, are also economic issues. A healthy ecosystem supports a vibrant economy and vice versa."

PHOTO CREDITS: PENNY PEPPERELL



Just as old abandoned barns have become iconic symbols of a by-gone era, perhaps stranded docks may serve the same purpose for Georgian Bay.

The facts are well-known to those in Georgian Bay. The U.S. Army Corps of Engineers reported that in January, Lake Michigan-Huron experienced its lowest water levels since monthly measuring began in 1918. Since then it has recovered somewhat but it is still 1.61 feet below the 1918-2012 June average. The rest of the basin, while faring better, is also well below historic averages.

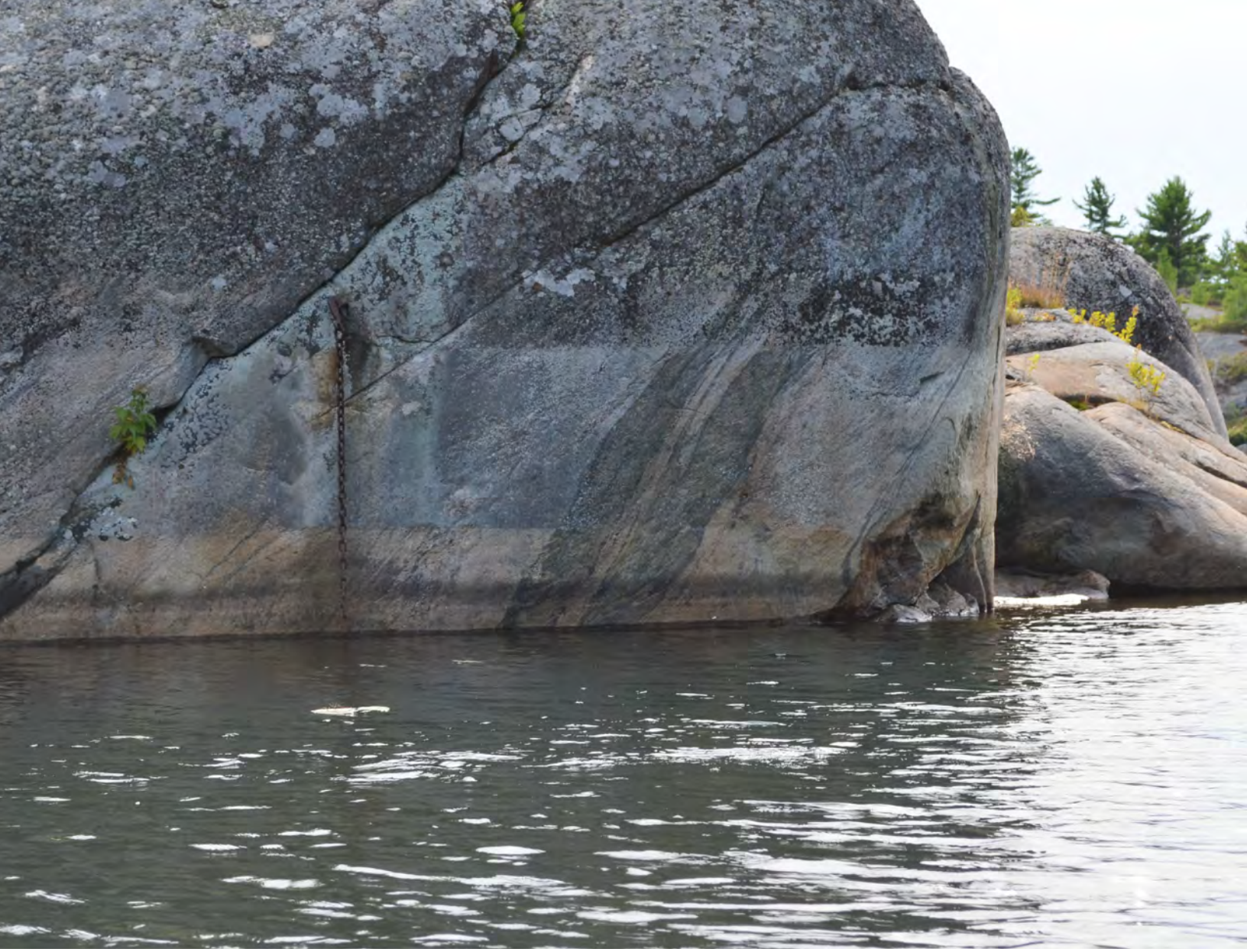
CGLR's water levels project will combine both top-down and bottom-up economic analyses. The top-down analysis will provide high-level estimates of the potential costs of declining water levels, both for the region as a whole, and for five sub-regions within it, as well as an overview of the declining water levels challenge.

The bottom-up analysis will estimate the impacts of declining water levels for the region's key industries and interests. Among others, it will estimate the impact on commercial shipping, power generation, water supplies, tourism, recreational boating, fishing, waterfront properties, harbours and infrastructure, agriculture and food, and the "blue economy".

The report is scheduled to be released in early 2014 and will complement recent work by the International Joint Commission, which recently raised the alarm about the adverse effects of declining water levels and urged governments to act.

Policy-makers require reliable economic data on which to base their decisions, and the CGLR study would provide a full picture of the economic costs associated with declining water levels.

The Council is currently in consultations concerning a second wave of the



study that would look at the costs of various policy and engineering interventions. Together, these two studies would allow for a full discussion of the economic costs and benefits of a variety of options—including if we do nothing.

Like many issues affecting the region, our economic and environmental interests are inseparable. With the launch of the Council's first project, we will highlight how these sometimes competing agendas need to be integrated.

In the Great Lakes Region, environmental issues, like water levels, are also economic issues. A healthy ecosystem supports a vibrant economy and vice versa.

The Great Lakes provides drinking water to millions, while also supporting power plants and industrial ports. The beaches and wetlands live side by side with heavy industry. Niagara Falls is both natural wonder and a key linchpin in power generation for the region.

The health of the lakes is tied to economic prosperity. Shipping, agriculture, energy and tourism all depend on the health of the Great Lakes. The water itself is crucial to the manufacturing and food processing sectors.

Lower water levels mean that shippers carry lighter loads, increasing shipping costs per tonnage. In turn, dock workers with less cargo to manage, lose jobs. Cargo then has to be trucked or carried by train, increasing fuel costs and emissions.

Lower water levels dry out wetlands, where many species of fish spawn and hatch. This damages the ecosystem and endangers food chains throughout the region. It affects the fishing industry, an important commercial and recreational activity and is essential to the First Nations and Native Americans.

Canadians and Americans are in the same boat when it comes to declining water levels. Impacts on one side of the border are felt on the other. With the creation of CGLR, we have a common voice.

CGLR's first project, in partnership with Forever, is ideal to showcase how we can work together in an integrated manner and make decisions that take into account long-term sustainability from environmental, economic and social perspectives.

Matthew Mendelsohn is the director of the Mowat Centre at the University of Toronto and a founding board member of the Council of the Great Lakes Region.

PHOTO CREDIT: DAVID SWEETNAM

By David Sweetnam

A REPORT ON GEORGIAN BAY FOREVER'S 2012 SCIENCE PROJECTS

Georgian Bay Forever's ambassador Katrina Gaibisels spent the summer talking about water, biodiversity and invasive species like the Silver Carp discussion here on the dock at Henry's Restaurant in Sans Souci.

Finally, the long awaited results of Georgian Bay Forever's 2012 science programs are in, and the news is good—along with a few counter-intuitive surprises. These programs were principally concerned with monitoring (in some cases minute) changes to the ecosystem. But vigilance, even in the face in consistently good report cards, is key to ensuring that our water remains swimmable, drinkable, fishable and healthy for our ecosystems. Forever.

The Township of Georgian Bay Water Quality: We're Doing Better than You'd Think

Our Township of Georgian Bay water quality program focussed on nutrients, total phosphorus (TP) concentrations, one of the most rudimentary indicators of aquatic health. (It's the first thing studied in algae outbreaks.) To effectively analyze our characteristically low phosphorus levels, we changed to a laboratory that could detect extremely low TP levels. A couple more years of data collection are necessary before trends can be observed but so far tests indicate levels are below their long term averages. Good news. We also changed our standardized collection method so that we could compare results with other regions and organizations. And, while we stepped up our game, we also managed to reduce costs.

A detailed account of the results can be found on our website.

Blue Green Algae Blooms: Not what You Want in your Back Bay

Forever also funded a more detailed study of the factors that allow blue-green algae blooms (a.k.a cyanobacteria the potentially toxic kind) to occur, research that was conducted by Prof. Lewis Molot of York University with the collaboration of Environment Canada and Ontario Ministry of the Environment. This research was conducted in Sturgeon Bay in the Pointe au Baril area and several other coastal embayments. While phosphorus plays a major role in the scale of these blooms, a lack of oxygen in the bottom waters can liberate other compounds such as ferrous iron and sulphates that feed these organisms. We observed how blue green algae dominated other algal communities in Sturgeon Bay as well as in some other embayments last fall. We hope monitoring these phenomena will ensure that external conditions do not trigger these potentially toxic events.

Areas at high risk of developing large, visible surface blooms if phosphorus levels (P) increase:

12 MILE BAY: 90 per cent of metalimnetic phytoplankton was cyanobacteria; phytoplankton density was intermediate; high internal iron loading but no internal P loading until September 2012.

"Vigilance, even in the face in consistently good report cards, is key to ensuring that our water remains swimmable, drinkable, fishable and healthy for our ecosystems. Forever."

SOUTH BAY: 73 per cent of metalimnetic population was cyanobacteria; low phytoplankton density; moderate internal iron loading and very little internal P loading.

Areas at intermediate risk of developing large, visible surface blooms if P levels increase:

NORTH BAY AND COGNASHENE: 25 – 42 per cent was cyanobacteria, respectively; low phytoplankton density; both had high internal iron loading but did not develop dominant cyano populations; no internal P loading in Cognashene; intermediate internal P loading in North Bay.

Searching through the Bottom Sediments in Honey Harbour

Forever also funded a paleolimnological study of bottom sediments, taking a sequence of slices from the North and South Bays in the Honey Harbour area to determine environmental conditions over the past couple of hundred years. Figuring out whether existing phosphorus levels are of recent origin or not could be helpful in developing defensive strategies. We found that conditions in these areas have not changed much over the centuries although we noted impacts from activities like logging and increasing development. For example North Bay phosphorus levels increased from the 1940s to the 1980s but then dropped back to pre-European settlement conditions: a counter-intuitive finding. Submerged plant growth has been on the rise since the 1950s; the bottom waters have always been anoxic; blue-green algae have always existed.

Both bays, pre 1800s, saw naturally occurring anoxia and blue-green algae, but more so South Bay. In the late 1800s the algae communities shifted a bit, possibly due to logging. The 1950s saw a period of increased algal productivity, anoxia and phosphorus in both bays and an increasing abundance of littoral midge and algae taxa, mostly in South Bay, reflecting decreased water levels and increased clarity. Since the 1980s the algae communities have shifted marginally, indicating an increase in water column stability due to warming and a decrease in North Bay phosphorus levels.

Bacteriological Testing in Honey Harbour

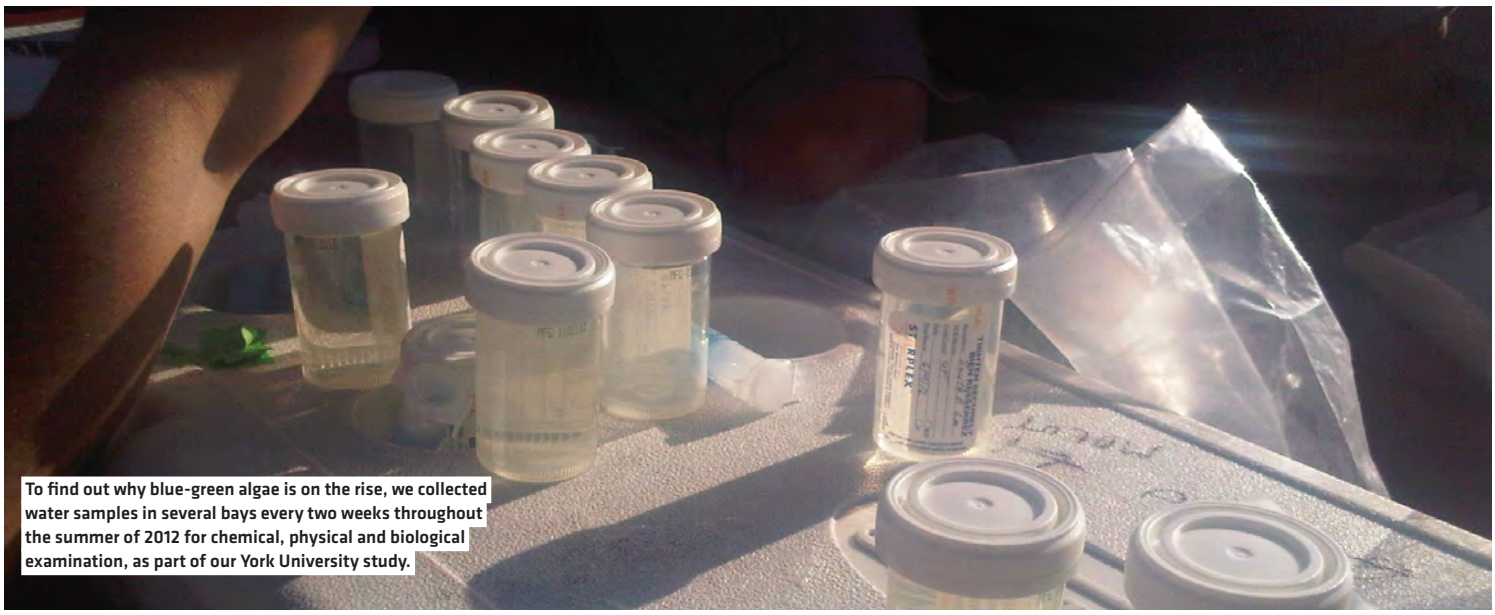
Last summer's water quality program also took in bacteriological conditions in Church Bay in the Honey Harbour area. Intense testing determined that recreational water quality remains good despite some differences between the 2002 program funded by the Ontario Ministry of the Environment and our 2012 program. Sources of bacteria appear to be sediment derived. The next step is to determine the origin of these organisms, to see if they are naturally occurring or are derived from geese, animals or humans using new technologies such as Microbial Source Tracking, a DNA-based technique.

Biodiversity Monitoring

Do read the article on page 8 about the University of Guelph's, state-of-the-science techniques that Forever is supporting. These will allow us to monitor changes in the ecosystem resulting from stressors like climate change, pollution or development, and to trace some of the invasive species present in the Bay back to their point of origin. All this data has been uploaded into an online international database putting Georgian Bay on the international map. Forever is currently working on a joint application with University of Guelph to expand this highly successful pilot study.

Forever is a leading source for science and education about our aquatic ecosystem and its response to climate change impacts like water level declines, warming water temperatures and invasive species.

PHOTO CREDIT: DAVID SWEETNAM



To find out why blue-green algae is on the rise, we collected water samples in several bays every two weeks throughout the summer of 2012 for chemical, physical and biological examination, as part of our York University study.

TAKING THE PULSE OF GEORGIAN BAY

By Neil Rooney

We all know that the Georgian Bay ecosystem is facing a multitude challenges. From dropping water levels, to invasive species, from climate change to algal blooms, Georgian Bay is under attack. Exactly how to assess the overall health of its ecosystem in the face of such perturbations is especially challenging. But consider how your family doctor assesses your overall health. No one measure reflects how healthy you are; rather your doctor uses a suite of diagnostic tools such as blood pressure, cholesterol levels, weight, and lifestyle to assess your health. Similarly, assessing the overall health of Georgian Bay should be multifaceted.

In this spirit, Forever is supporting my team of researchers at the University of Guelph as they tackle some of the most vexing problems facing Georgian Bay using state-of-the-science technology, a suite of tools that can assess the influence of human stressors on the structure and function of critical aquatic habitats.

Our first objective is to catalogue the biodiversity of the Georgian Bay ecosystem, a Herculean task if one were to follow traditional procedures for species identification. However, Guelph's novel genetic approach allows for the rapid and precise identification of all organisms (from the microscopic plankton to the biggest fish) using the smallest of tissue samples. This process, known as DNA bar coding, promises to provide the essential inventory of species in the Bay's iconic ecosystem.

> "Only when considered in the context of their genetic and physiological measurements can we begin to understand how human activities are affecting the sustainability of the Georgian Bay ecosystem."

Our second objective is to measure the stress experienced by individual organisms. By analyzing stress hormone levels within fish communities throughout the Bay, researchers can identify species that are experiencing the most pressure. Where individuals and areas are stressed, the entire ecosystem may be at risk of being compromised.

To address this final point of ecosystem impacts, researchers are examining how the food web of Georgian Bay changes along a gradient of human impacts. Using stable isotope analysis, which can determine where species are feeding and what their food sources are, our research team is documenting how human influences change the sustainability of the ecosystem. These ecosystem level effects are of greatest concern, but simply measuring them might leave us with no mechanistic explanations for their cause. Only when considered in the context of their genetic and physiological measurements can we begin to understand how human activities are affecting the sustainability of the Georgian Bay ecosystem.

So, not unlike the approaches taken to assess our own personal health, we are taking a comprehensive approach to assessing the health of Georgian Bay. This will identify not just the multiple aspects of Georgian Bay's condition, but also the baseline information necessary to evaluate its future conditions. With these studies, Forever is establishing itself as a trailblazer in environmental stewardship.

Neil Rooney is an assistant professor, Saugeen Ojibway - University of Guelph Faculty Partnership School of Environmental Sciences.

HOME IS WHERE THE ART IS FOR THE JACKMAN FAMILY

By Debra Stuart

Oscar Wilde said, "Life imitates art far more than art imitates life." Wilde maintained that what is found in life and nature is what artists have taught people to find there, through art. The Group of Seven taught the world about the unique beauty of the Canadian landscape. Much of the artists' inspiration came from time spent in a pine cottage on Georgian Bay, a cottage that ultimately became a grand, national landmark.

Eric Jackman now owns the iconic cottage where art and nature, and family are seamlessly intertwined. His parents purchased the property in Go Home Bay in 1949 from the estate of Dr. James MacCallum.

Artists from the Group of Seven frequented MacCallum's cottage, using the boathouse as their base from where they journeyed off to paint the islands. MacCallum commissioned them to paint murals to decorate the walls of his cottage living room.

Eric recalls, "The day we took possession it was raining and the roof was leaking. Water was dripping from the rafters onto the painted wall panels. My mother implored my brother and I to do something. She recognized that we needed to preserve these murals for their historical significance, so we devised a makeshift solution that diverted the water into pails on the floor."

In 1967, the murals were donated to the National Gallery of Canada, where the MacCallum-Jackman Cottage Gallery was built as a replica of the original cottage living room, with each mural hung in its original place.

Eric commented, "There is a powerful emotional connection to the surreal Georgian Bay landscape, the art and our lives. I have never missed a summer at our cottage in over 60 years."

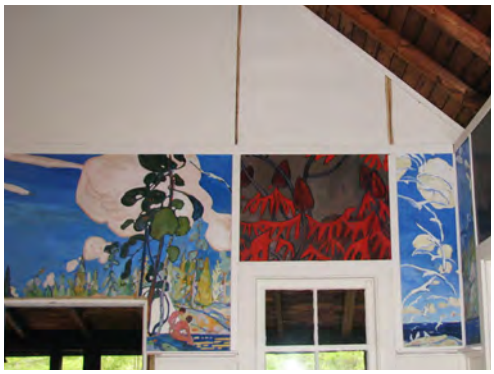
"As a young boat boy, I delivered groceries, fresh milk and mail to the local cottagers in my five horsepower boat. One summer day in 1950, my cottage pal and I were tacking aimlessly in an old sailboat, only to learn later that our images had been "fixed in time," in a painting A.Y. Jackson was working on from the shore," said Eric.

Eric commissioned the artist Sarah Merry to make copies of the original Group of Seven murals so they could once again adorn his cottage living room. He rushed to install them before a neighbourhood church service, which was to be held at his place. More than one hundred attendees gathered in reverence for the artists' legacy.

Eric said, "The occasion was deeply personal. There is a parallel, in that the paintings, although replicas, returned to their original home, as our family does, regardless of where we live the rest of the year. Our Georgian Bay cottage is our sanctuary —the only constant home our family has known through multiple generations."

"Studying the economic impact of low water levels, as Forever is now doing, is crucial, noted Eric. Low water levels force boats to lighten their loads on the Great Lakes."

"One summer day in 1950, my cottage pal and I were tacking aimlessly in an old sailboat, only to learn later that our images had been "fixed in time," in a painting A.Y. Jackson was working on from the shore."



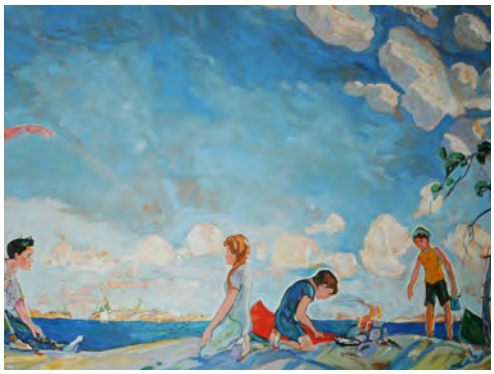


PHOTO CREDIT: SARAH MERRY

ABOVE LEFT: Copies of the original Group of Seven paintings in the Jackman cottage. ABOVE CENTRE: *The Picnic* by Arthur Lismer. ABOVE RIGHT: Eric Jackman commissioned Sarah Merry to paint copies of the original works that now hang in the National Gallery in Ottawa.

VITAL SIGNS III

Join us for the return of the Vital Signs lecture series.

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THIS YEAR'S SPEAKERS INCLUDE:

KEYNOTE

Gord Walker
IJC Commissioner, Canadian Section

David Sweetnam
Executive Director, Georgian Bay Forever

as well as the **New ED of The Council of the Great Lakes Region**

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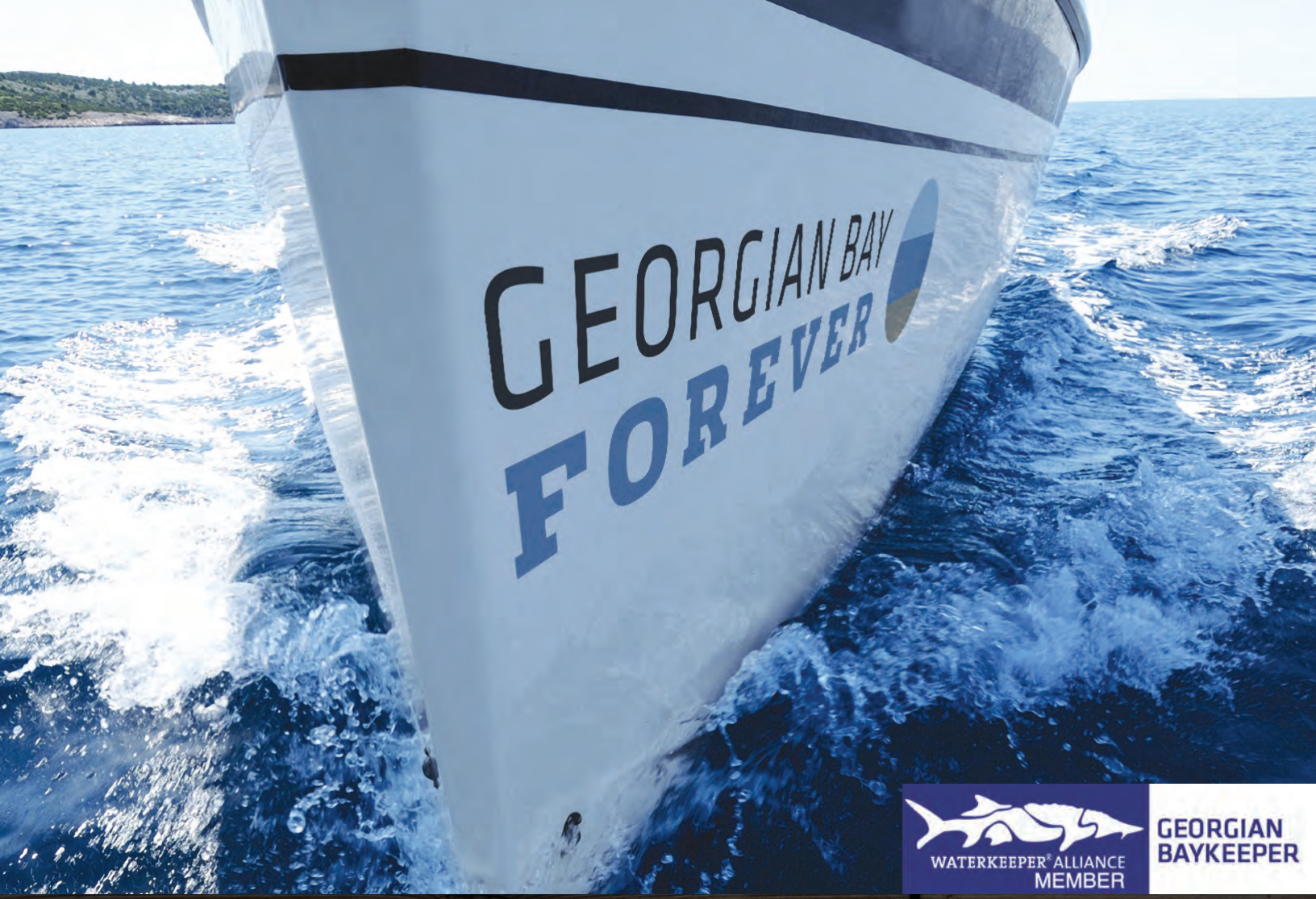

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—Lana Pollack—
chair of the U.S. section,
International Joint Commission

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