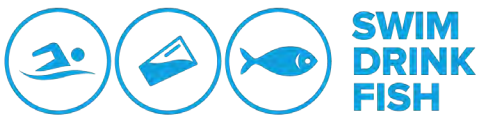


# A Call for Transparency

## TORONTO COMMUNITY-BASED WATER MONITORING PROGRAM REPORT

2022





This report was produced by Swim Drink Fish

For more information visit:

[www.swimdrinkfish.ca](http://www.swimdrinkfish.ca)

[www.theswimguide.org](http://www.theswimguide.org)

[www.recreationalwater.ca/toronto](http://www.recreationalwater.ca/toronto)

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This report is dedicated to the volunteers, staff, supporters, partners, and members of the movement who are all working towards a swimmable, drinkable, fishable future for everyone.

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# EXECUTIVE SUMMARY

The Toronto Monitoring Hub is a community-based water monitoring program that has been routinely overseeing the Lake Ontario Shoreline since 2016. The Toronto Hub is one of four Swim Drink Fish community-based water monitoring hubs across Canada that work as a network of hubs connecting people to water.

The sixth annual Toronto Hub report is a call to action for the City of Toronto to improve transparency regarding combined sewer overflow events. Our monitoring program consistently documents extremely high levels of E. coli (an indicator bacteria for sewage) at several locations in the Toronto Harbour, where people actively use the water for recreation. These high E. coli levels are documented during both wet and dry weather.

In 2022, after collecting five years of data, we're able to reflect on the variability we see in our water quality results over space and time. Our data suggests a trend of unpredictability in whether sites will pass or fail, and beyond the water quality samples we collect, no transparency around why this happens. This leaves the public unable to confidently and consistently make informed decisions about when and where they can enter the water.

**Swim Drink Fish maintains its suggestion that it's due time for the City of Toronto to improve access to information about our waters. While we continue to work towards the recommendations we've made in previous reports, we wanted to highlight one major goal this year:**

## **We need transparency around Combined Sewer Overflows.**

We are pushing for transparency because we believe this is the key first step to connecting Torontonians back to the water. By providing information around when and where combined sewer overflows are happening, the City of Toronto can help our growing community of recreational water users confidently access the water, and together, we can continue to counter our historical alienation from our waterfront.

Toronto is at a watershed moment. The City of Toronto can either embrace its people and our new-found identity as a city connected to water, or we can remain stagnant. As other Canadian cities implement aspects of these recommendations, such as adopting real-time sewage monitoring, creating swimmable and well monitored waters, and working to inform its community members of water quality issues, Canada's largest city lags behind. We encourage the City of Toronto to join us in supporting our vibrant community of recreational water users and safeguarding the waters that are constitutive to us all.

## **Acknowledgments:**

### **Land and Water Acknowledgment**

We would like to acknowledge that T'karonto, the land on which the Toronto Monitoring Hub exists and the staff and community scientists who participate in this work live is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. This place is also now home to many diverse First Nations, Inuit, and Metis Peoples.

The Toronto Monitoring Hub's work is inspired by the long history of Indigenous land stewardship and water keeping in the region. The First Nation communities that live in the Great Lakes region have been taking care of and fostering a relationship with the water since time immemorial. Perhaps best exemplifying this environmental ethic is the The Dish with One Spoon concept, which reminds us that it is our shared responsibility to take care of the land and water we depend on, so that the health of all beings (human and non-human) is maintained in perpetuity.

We also wish to acknowledge the water itself. Lake Ontario, which in Iroquoian means "Lake of Shining Waters", gives life to all of us who live on its shores and along its watershed boundaries. It is the reason we are here today. We recognize that we have a responsibility to our waters to heal them, protect them, celebrate them, and thank them for all they do for us. The Great Water Walker, Elder Josephine Mandamin, spoke to this notion of reciprocity when she said, "Water is alive. Give it respect and it can come alive. Like anything. Like a person who is sick... if you give them love, take care of them, they'll come alive. They'll feel better. It's the same with our mother, the Earth, and the water. Give it love."

## Diversity, Equity & Inclusion

As we advocate for our waters, we are committed to building relationships and interconnectedness with all communities through consultation, collaboration, and partnership in the sharing of stories, voices, and values that connect us all to the water. Our work endeavors to celebrate, share, and support everyone's rights to free access to swimmable, drinkable, fishable water.

## With Our Thanks

The work we do could not be done without the support of our community and the growing interest to protect and restore our waters. We would like to thank:

Our community scientist volunteers whose dedication to monitoring and passion for their local waters cannot be overstated. Community scientists are integral to this program, which became all the more clear as they showed up week after week to monitor and share knowledge about their local waters. A special thank you to our Community Site Leads who have been monitoring our Toronto Island and Humber Bay Park West sites for years. Without their continued support we would not have vital water quality information that informs all we do. We are very grateful for their continued commitment to the water.

Our corporate collaborators, Bullfrog Power, Uniqlo, Canon, ONEAI and Daltile-Mohawk who conducted workshops with us in 2023. Our event co-hosts Shoreline Revival Group, Something In The Water Brewing, Patagonia Toronto, Lake Surfistas, and the U of T Trash team who all supported our season opening and closing events in 2022. We owe a continued thanks to our friends at the Harbourfront Centre, who have graciously given us space to operate our hub out of since 2018.

We would like to thank the entire Swim Drink Fish team for ensuring a successful monitoring season that brought communities back together.

## About Swim Drink Fish:

Swim Drink Fish is an environmental not-for-profit focused on connecting people to water, because connection leads to protection. We have been working on connecting people to water since 2001. We use community science and communications technology to inspire people to advocate for and appreciate their local waters. Swim Drink Fish operates many programs along with the Community-Based Monitoring Hubs including: the Swim Guide, Blue Flag, The Watermark Project, and Biinaagami. All of these programs work to connect communities to water and empower people to protect the waters they love.



# INTRODUCTION TO THE TORONTO HUB

The purpose of the Toronto Hub is to support Toronto’s recreational water community to access Toronto’s expansive shoreline. We do this by collecting and sharing up-to-date recreational water quality information for unmonitored yet popular recreational water use areas. Collecting and sharing this information allows us to establish baseline data trends to better understand issues and empower people with knowledge to know when, where and how they can use the water. Along with water quality monitoring, the hub conducts outreach, advocacy, and water literacy engagement programming, which is explained in further detail below.

## Volunteer Engagement:

The Toronto Hub continues to maintain a dedicated and growing volunteer network in the 2022 sampling season. Both of the community sites were successful in monitoring from June-September of 2022 and provided valuable results that would not have been possible without their continued contribution to our organization.

The Toronto Hub also hosted placement participants from the [Ocean Bridge Direct Action Program](#) operated by Ocean Wise. We also hosted two interns through the Canadian Conservation Corps program run by the [Canadian Wildlife Federation](#). These programs help young professionals gain experience in the Environmental Field. Having these participants with us allowed for increased capacity for sampling and attending events throughout the 2022 sampling season.

In total the Toronto Hub had:

**46**

DIFFERENT COMMUNITY SCIENTISTS

**365**

HOURS OF VOLUNTEER WORK IN THE 2022 SAMPLING SEASON

**“Be connected to the water. Find some way to enjoy it, whether it’s fishing, paddling, swimming or sitting near the lake with a book. The more we interact with our waters, the more reason we have to protect them.”**

**- Julian Ganton (Community Scientist from the Toronto Island Monitoring Team, Owner of [Toronto Island SUP](#))**



## Water Literacy and Community Connections:

Water Literacy Initiatives in Toronto have focused on expanding our communities' understanding of our local waters and connecting different community interest groups together through a shared connection to water. Listed below are some of our community groups who we engage and collaborate with regularly through shared programming and events.

1. **Harbourfront Center:** The Toronto Hub was hosted by the Harbourfront Center for our lab space this year. In collaboration with this group we operated out of this space and provided programming for a large number of youths who attended camps at this center including the Quest Camps and the Leader in Training camps.
2. **The Toronto Inner Harbour Floatables Strategy:** [The Toronto Inner Harbour Floatables Strategy](#) is a collaborative strategy with a mission to reduce plastic pollution and other floating litter in Toronto's harbour. It is a partnership between Swim Drink Fish, [Toronto and Region Conservation Authority](#), the [Toronto Remedial Action Plan](#), [University of Toronto Trash Team](#), [PortsToronto](#), [City of Toronto](#), [Waterfront Business Improvement Area](#), and [Harbourfront Centre](#).

This season we continued working with the [Floatables Strategy](#) team on upstream and downstream solutions to fighting floatables in Toronto's Inner Harbour. In 2022, we worked in conjunction with the U of T Trash team to conduct both simple and detailed waste characterizations of the Marina Four Seabin. Volunteers were invited to join us to get an up close and personal look at the types of debris the Seabin collects, and while collecting information on these debris to inform upstream management. We will continue our engagement with the Floatables Strategy into the next season.

3. **A Greener Future:** We collaborated with A Greener Future for a series of shoreline cleanup and water quality monitoring demonstrations during the 2022 season. Engaging in these cleanups exposed hundreds of people to water literacy programming and connected the dots between cleaning up our shorelines and cleaning up our waters.

The Hub also continues to host a series of water quality workshops with community and corporate groups where we talk about our connection to water, discuss issues with water quality in Toronto, and give folks a try at collecting a water sample. This year we hosted such events with organizations including: Toronto Island SUP, Don't Mess with the Don, Shoreline Revival Group, Lost Rivers, Surf Dreams Canada, and Canadian Conservation Corps, among others.

**In total the Toronto Hub engaged over 700 people in water literacy over the course of the 2022 sampling season. This includes engaging with community members during special events, speaking opportunities, and the folks involved in water quality monitoring programming. A total of 120 of those people were youths.**

**We were able to reach this many people because of collaboration with our community partner organizations. We collaborated with 26 various organizations, hosting 33 events outside of regular sampling operations.**

**700+**

PEOPLE ENGAGED IN  
WATER LITERACY

**26**

ORGANIZATIONAL  
COLLABORATIONS

**33**

EVENTS OUTSIDE OF  
REGULAR SAMPLING

## Monitoring Locations and Season

The Toronto Hub regularly samples at three sites in the Inner Harbour: at Marina Four, Rees St. Slip, and Bathurst Quay, as well as two locations at Ontario Place on the West Island. In addition to these, other locations are community-led sites including one site at Humber Bay Park West and two sites on Toronto Island (Snake Island and Algonquin Bridge). These sites are fully volunteer led.

Table 1. Toronto Hub 2022 Monitoring Sites, Season Duration, and Number of times sampled

SITE	MONITORING SEASON	TIMES SAMPLED
Humber Bay Park West	Jun 7 - Sept 8 2022	12
Snake Island	Jun 14 - Aug 23 2022	10
Algonquin Bridge	Jun 14 - Aug 23 2022	10
Bathurst Quay	Jun 2 - Oct 25 2022	26
Marina Four	Jun 9 - Oct 27 2022	33
Rees St. Slip	May 19 - Oct 13 2022	31
Ontario Place	Jan 27 - Oct 27 2022*	53

\*Ontario place is sampled year round however the data in this report is based on of the time frame above

In 2022 the Hub submitted **167 field reports**, collected **1,174 samples**, and published **155 results** on the Swim Guide.

**This report contains only our results and updates relevant to 2022. To view information about the Toronto Hub including site locations and descriptions, our standard operating procedure for recreational water quality monitoring, our protocols, regional water quality issues, and the regional water quality standards visit our website here: <https://www.swimdrinkfish.ca/toronto-hub>**



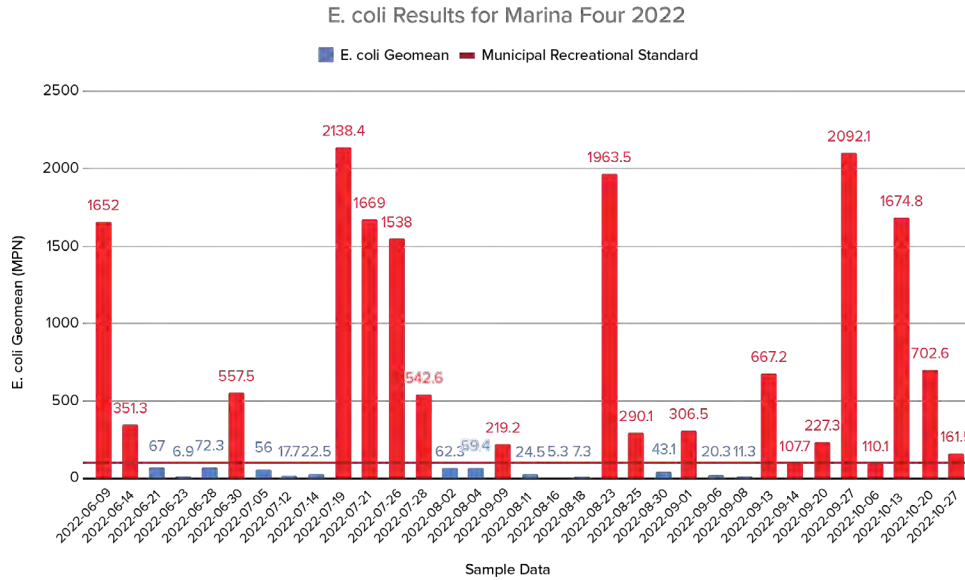


# TORONTO HUB RESULTS 2022

## Pass/Fail Rates and E. coli Results

### MARINA FOUR

This was the fifth year of monitoring at Marina Four. Marina Four was sampled 33 times between June 9th and October 27th 2022. The site met the [pre-2018 provincial standard](#) 42.4% of the time. The highest E. coli geomean result was 2138.4 (MPN) on July 19th 2022. This result is a decline in water quality from the previous year which had a pass rate of 60.6%.

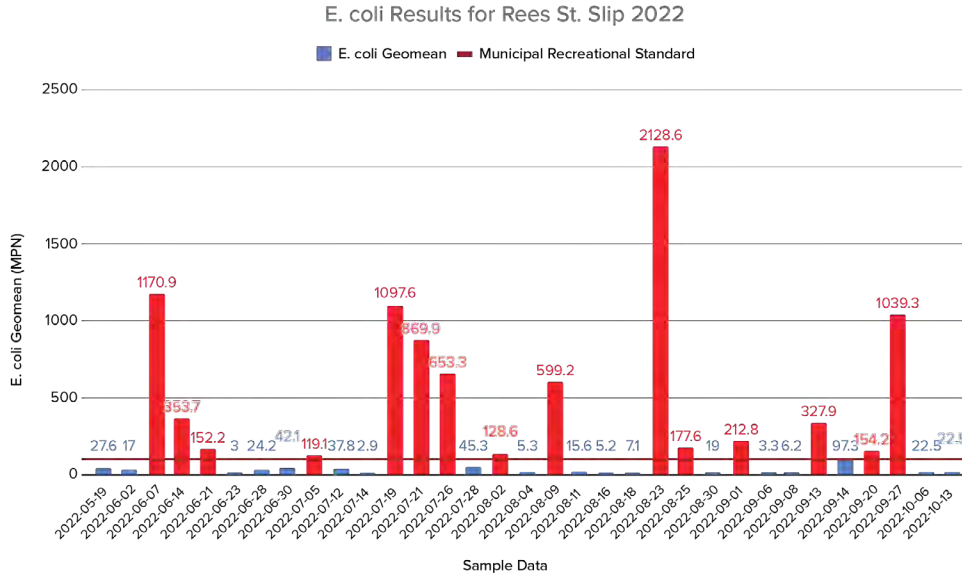


**Figure 1.** E. coli geomean results for Marina Four over the 2022 sampling season. Results are expressed as a geometric mean of six 100 mL single samples. Results are expressed as MPNs (most probable number). The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.



## REES ST. SLIP

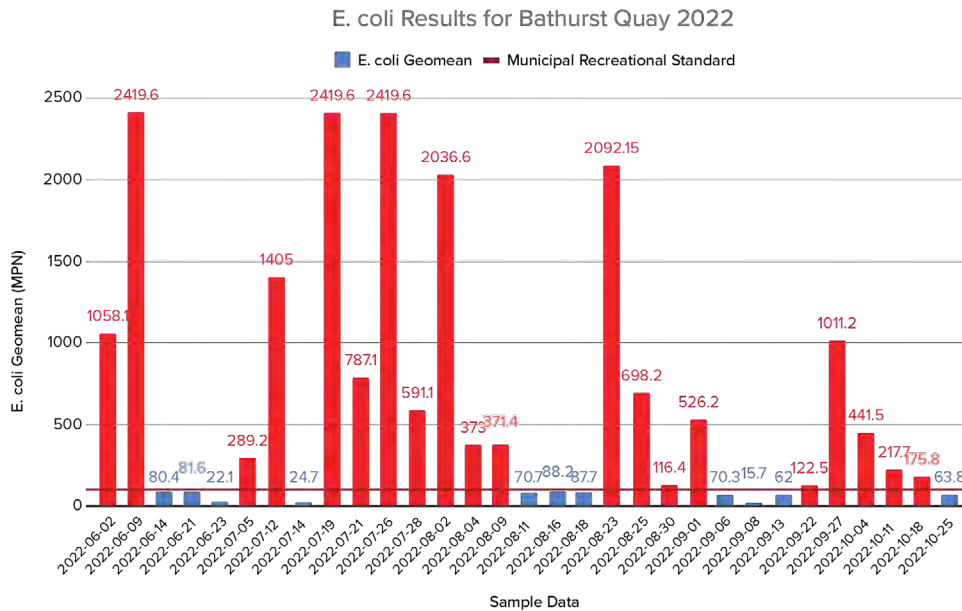
This was the fifth year of monitoring at Rees St. Slip. Rees St. Slip was sampled 33 times between May 19th and October 13th 2022. The site met the pre-2018 provincial standard 54.8% of the time and had two invalid samples. The highest E. coli geomean result was 2128.6 on August 23rd 2022. This result is a decline in water quality from the previous year which had a pass rate of 77.4%.



**Figure 2.** E. coli geomean results for Rees St. Slip over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as MPN (most probable number). The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.

## BATHURST QUAY

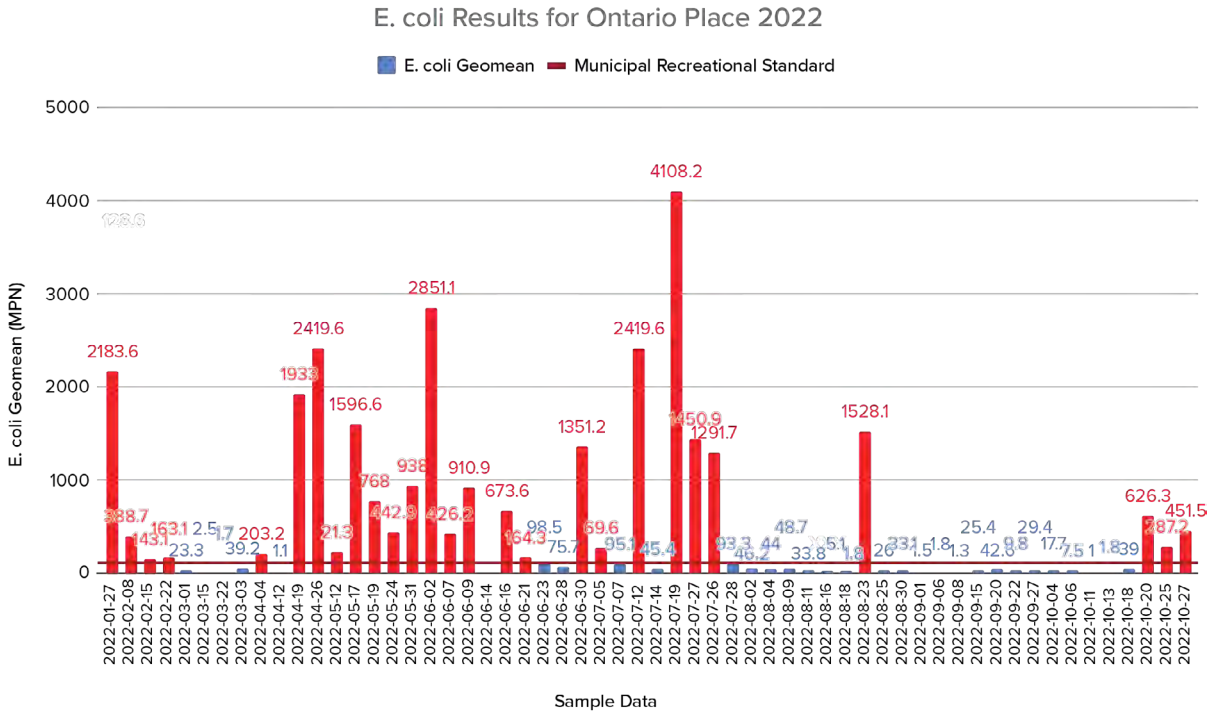
This was the fifth year of monitoring at Bathurst Quay. Bathurst Quay was sampled 31 times between June 2nd and October 25th 2022. The site met the pre-2018 provincial standard 42.3% of the time and had four invalid samples. The highest E. coli geomean result was 2419.6 on June 9th, July 19th, and July 26th 2022. On these dates, E. coli concentrations exceeded the analysis capacity of the IDEXX lab without dilutions. This result is an increase in water quality from the previous year which had a pass rate of 21%.



**Figure 3.** E. coli geomean results for Bathurst Quay over the 2022 sampling season. Results are expressed as a geometric mean of six 100 mL single samples. Results are expressed as a MPN (most probable number). Sample results indicating a 2419.6 (MPN) geomean exceeded the capacity of the IDEXX enumeration system without dilutions. Actual results are assumed to be higher than this amount. The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.

**ONTARIO PLACE WEST ISLAND - SOUTH BEACH:**

This was the fifth year of monitoring at Ontario Place. Ontario Place was sampled 58 times between January 27th and October 27th 2022. The site is sampled twice per week in the summer between June-September, and once per week for the remainder of the year. The site met the pre-2018 provincial standard 52.8% of the time and had five invalid samples. The highest E. coli geomean result was 4108.2 on July 19th. This result is a decrease in water quality from the previous year which had a pass rate of 85.2%



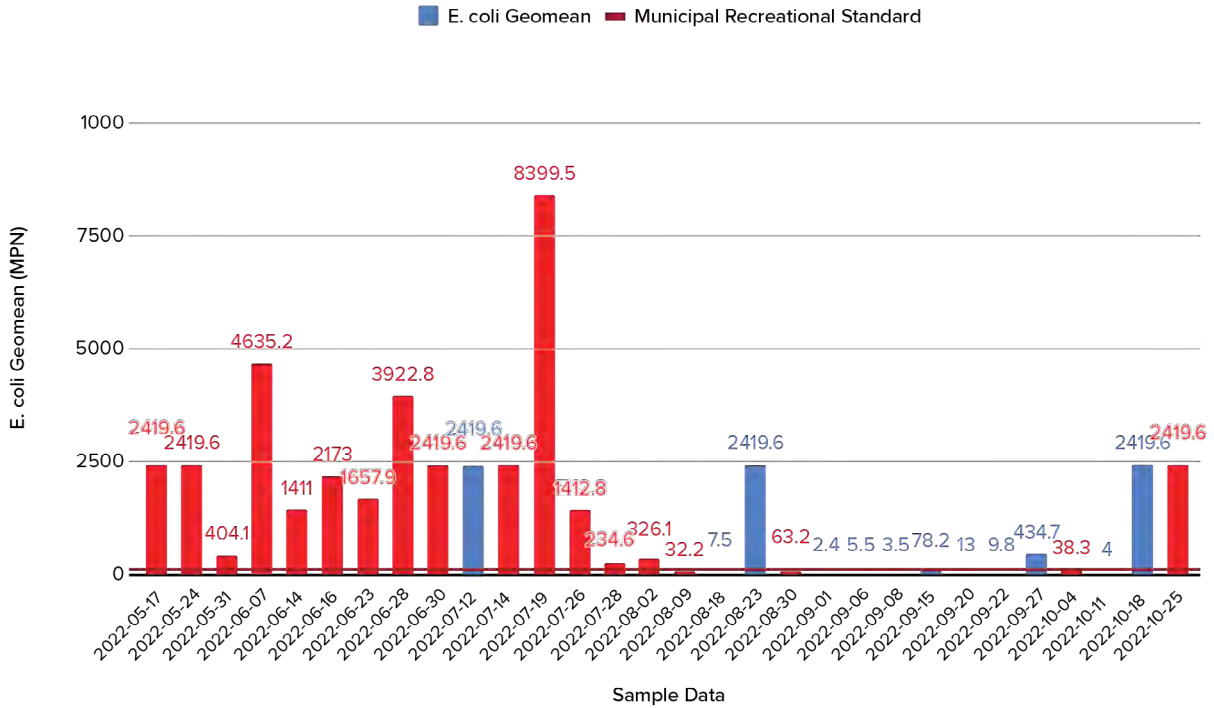
**Figure 4.** E. coli geomean results for Ontario Place West Island - South Beach over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as an MPN (most probable number). Sample results indicating a 2419.6 (MPN) geomean exceeded the capacity of the IDEXX enumeration system without dilutions. Actual results are assumed to be higher than this amount. The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.



## ONTARIO PLACE WEST ISLAND - WEST BEACH

This season we also sampled at a second location at Ontario Place located on the west side of West Island due to concern of a nearby combined sewer outfall. This site was sampled 31 times between May 17th and October 25th, 2022. The site met the pre-2018 provincial standard 36.7% of the time and had one invalid sample. The highest E. coli geomean result was 8399.5 on July 19th.

### E. coli Results for Ontario Place West Beach 2022

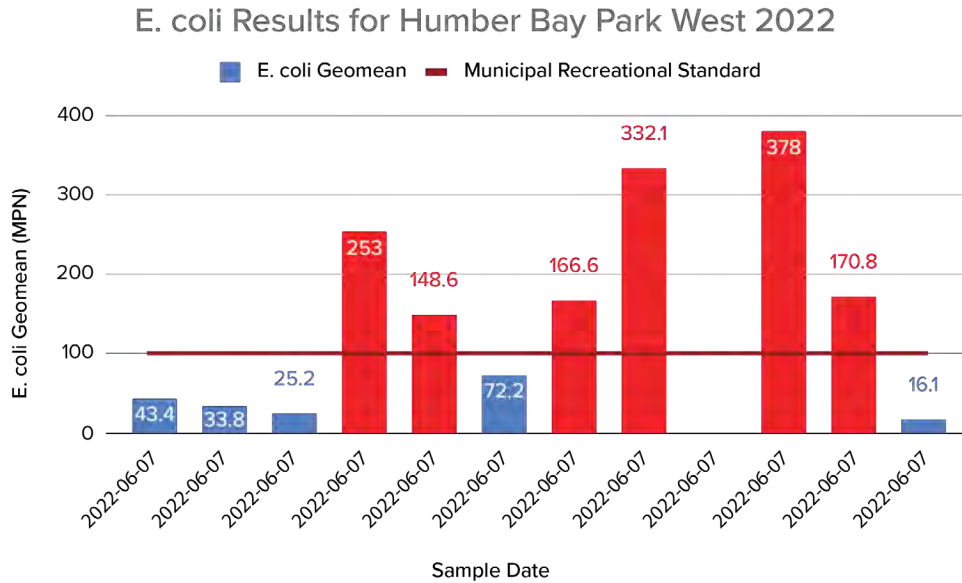


**Figure 5.** E. coli geomean results for Ontario Place West Island - Western Site over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as an MPN (most probable number). Sample results indicating a 2419.6 (MPN) geomean exceeded the capacity of the IDEXX enumeration system without dilutions. Actual results are assumed to be higher than this amount. The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.



## HUMBER BAY PARK WEST

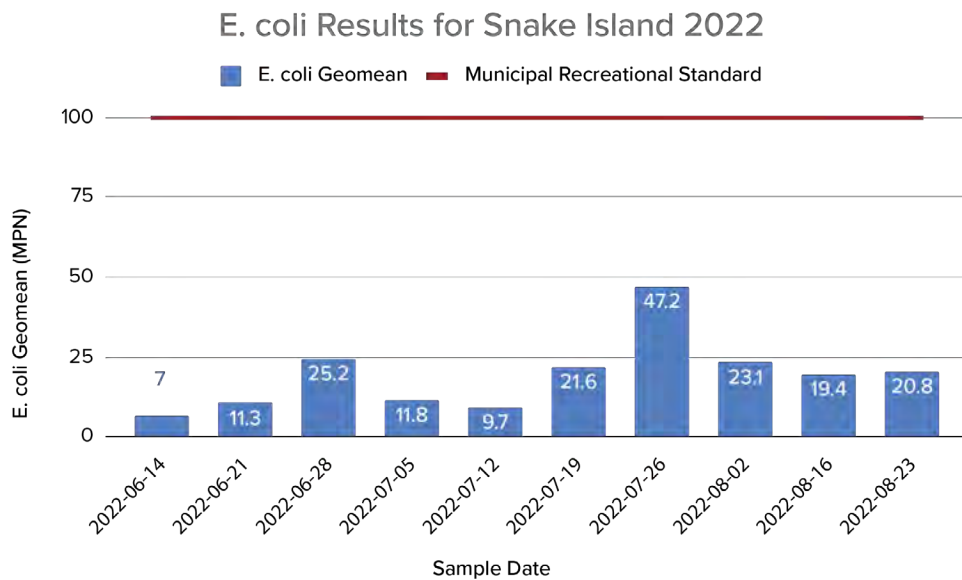
This was the fourth year of monitoring at Humber Bay Park West. Humber Bay Park West was sampled 12 times between June 7th and September 8th 2022. The site was sampled weekly. The site met the pre-2018 provincial standard 45.5% of the time and had one invalid sample. The highest E. coli geomean result was 378 on August 18th. This result is a decrease in water quality from the previous year which had a pass rate of 75% and is the lowest recorded pass rate since sampling began at this location.



**Figure 6.** E. coli geomean results for Humber Bay Park West over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as an MPN (most probable number). The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.

## SNAKE ISLAND

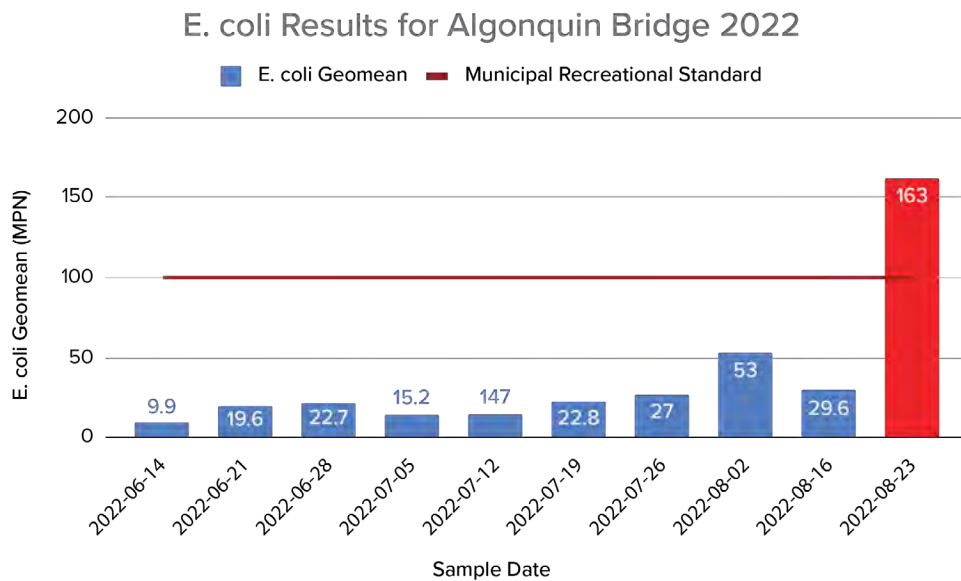
Snake Island was sampled 10 times between June 14th and August 23rd, 2022. The site met the pre-2018 provincial standard 100% of the time and had one invalid sample. The highest E. coli geomean result was 47.2 on July 26th. This result is consistent with previous years that also had a 100% pass rate.



**Figure 7.** E. coli geomean results for Snake Island over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as an MPN (most probable number). The Municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.

## ALGONQUIN BRIDGE

Algonquin was sampled 10 times between June 14th and August 23rd, 2022. The site met the pre-2018 provincial standard 90% of the time and, had invalid sample and failed 10% of the time. The highest E. coli geomean result was 163 on August 23rd. This result is a slight decline in water quality as this site has historically passed 100% of the time.



**Figure 8.** E. coli geomean results for Algonquin Bridge over the 2022 sampling season. Results are expressed as a geometric mean of five 100 mL single samples. Results are expressed as an MPN (most probable number). The municipal standard is 100 E. coli/100 mL of water. Anything greater than or equal to that value is considered a failure.



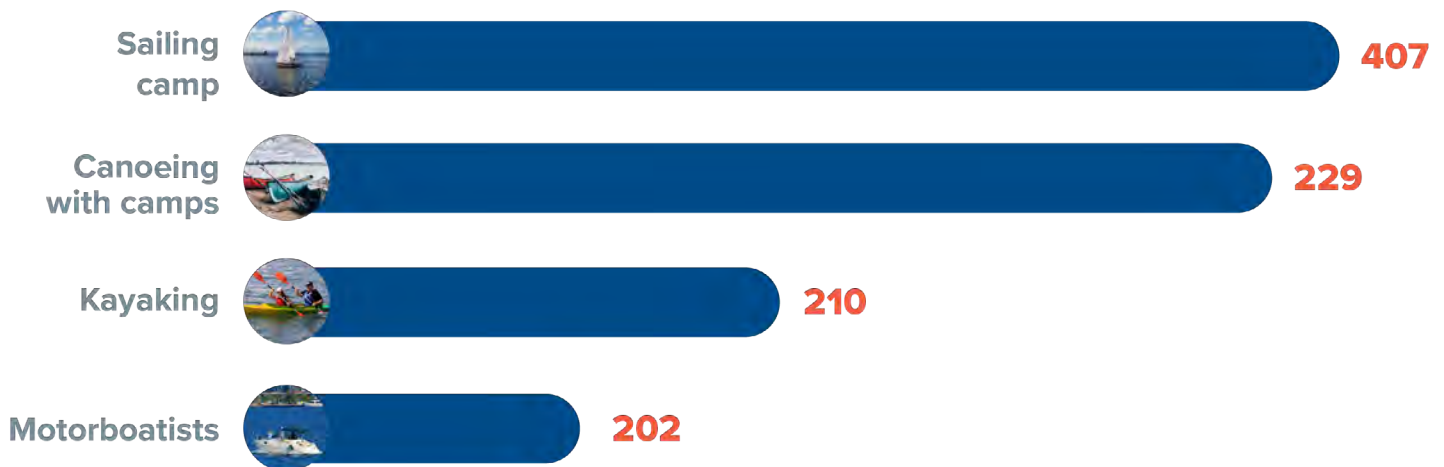
# WHO'S USING THE WATER?

Over the 2022 monitoring season, **over 100 primary contact recreational water users were observed**. The majority of these water users included swimmers and SCUBA divers at Ontario Place West Island Beach and Humber Bay Park West (respectively). Some primary recreational water users were observed at our Toronto Island sites as well. This is an increase in observed primary contact water users from years prior.

## FACT:

A **primary contact** recreational water activity is any activity where it is highly likely that water will be ingested, and typically includes any activity where your whole body will be submerged in the water (e.g. swimming, surfing, and SCUBA diving).

**Secondary contact** recreational water activities include those where it is unlikely that you'll be submerged in or swallow water (e.g. sailing, canoeing, kayaking)



Total number of secondary water users observed at all sites in 2022

## Observations

The majority of these water users were observed at Rees St. Slip where the Harbourfront Canoe and Kayak Center, and Harbourfront Centre Sailing and Powerboating operate. Marina Four and Bathurst Quay sites are used much less for recreation on the water and consist mostly of motorboatists who either live or work in the marinas. Humber Bay Park West and Ontario Place have some observations of secondary recreation but the rates are relatively low.

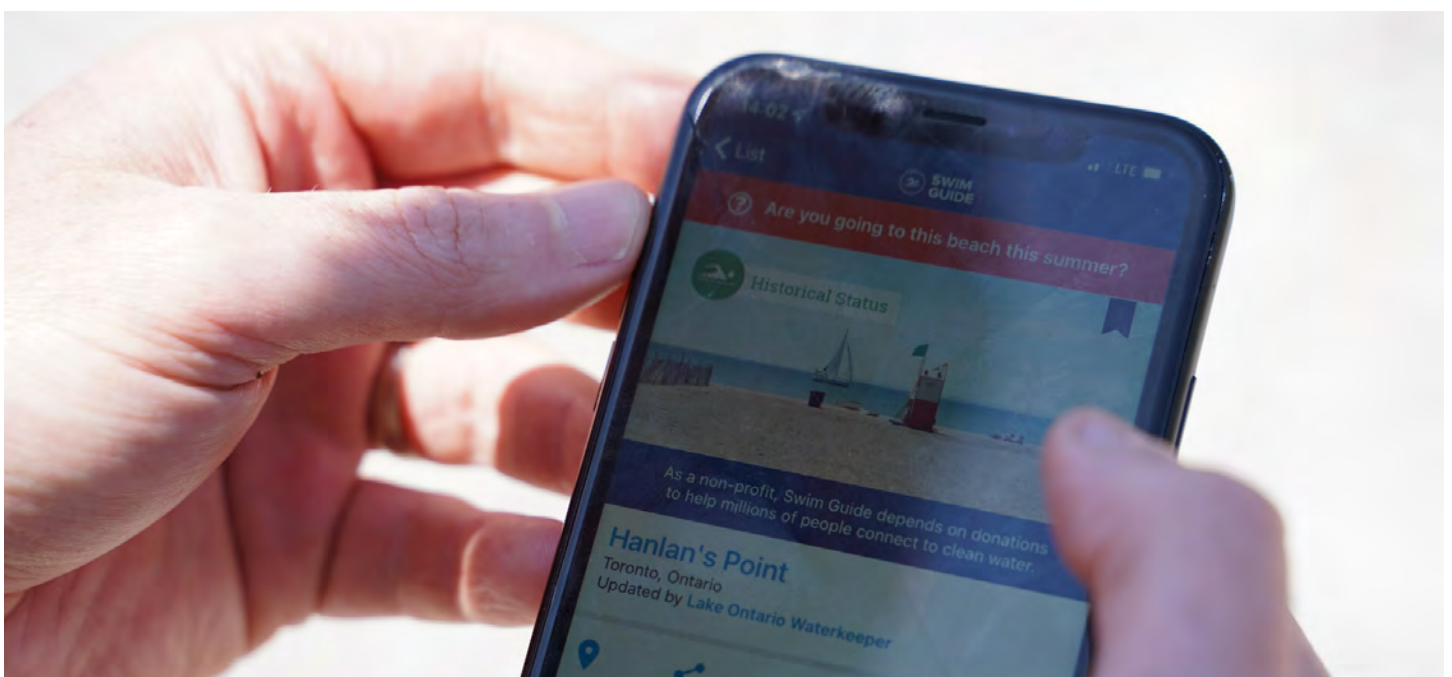
Notably, our team samples during low activity periods - early morning, during weekdays - and therefore these data are not reflective of peak recreational periods such as midday where temperatures are elevated and weekends.

## Swim Guide

We share water quality results for the Swim Drink Fish monitored sites and Toronto official city beaches (monitored by Toronto Public Health) on the Swim Guide. We track engagement with Swim Guide sites to understand where in Toronto people are interested in learning about water quality and access to water. As you can see in Table 1, general engagement has stayed relatively stable overall since 2020 with a big increase between 2019 and 2020, likely due to COVID-19 restrictions encouraging people to be outside more often.

**Table 1: Summary of Swim Guide webpage visits for each beach site over time (Jan 1st to Dec 31st of 2019-2022)**

SITE	2019	2020	2021	2022
Bathurst Quay	1956	1619	2027	1906
Marina Four	1676	2271	2292	1750
Ontario Place West Island Beach	1570	4668	7126	7402
Rees St. Slip	1408	1744	2452	2305
Humber Bay Park West	4202	7066	6125	4202
Algonquin Bridge	1351	1647	2398	1656
Snake Island	841	2162	2341	2683
<b>Totals:</b>	<b>13,004</b>	<b>21,177</b>	<b>24,761</b>	<b>21,904</b>







# ENVIRONMENTAL OBSERVATIONS RESULTS

## Litter and Floatables

Our 2022 observations consistently noted high levels of plastic debris, styrofoam, sewage-related floatables, and hazardous debris across the Inner Harbour. As we do not currently monitor or record the presence of microplastics, readers should note that the true value of total plastics at these sites is likely significantly higher than recorded observations. At the Inner Harbour sites, the most frequently observed form of litter was **styrofoam pieces** making up 76.9% of all debris at Bathurst Quay, 60.1% at Rees St. Slip, and 66.4% at Marina Four.

At 69.9% of Inner Harbour site visits, sewage debris was present, which is an improvement from the previous year where 76% of visits had it present. There was an increase in sewage debris present at the west end sites, notably at Ontario Place where an abundance of wipes and tampons/tampon applicators were observed. Other forms of sewage debris that was noted at that site were condoms/condom wrappers, dental hygiene, and feminine pads. There is still little evidence of sewage debris present at Humber Bay.

The increase in sewage debris at Ontario Place can be in part explained by the presence of a CSO located to the west of the site. It was near the outfall location of the CSO that an abundance of sewage-related debris was observed.

Total Sewage Debris

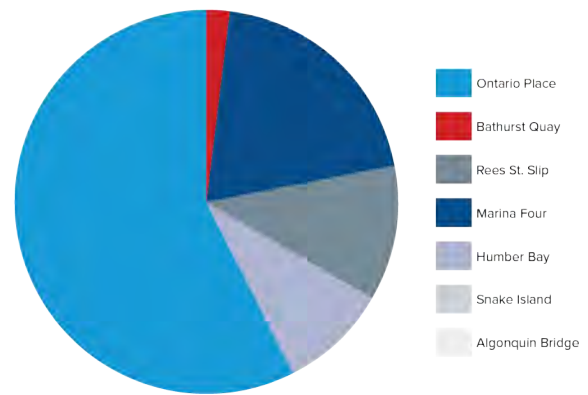


Table 2: Summary of debris at all sites highlighting the amount of sewage-related debris present.

SITES	TOTAL DEBRIS COUNT	TOTAL SEWAGE DEBRIS	TIMES SAMPLED	AVERAGE DEBRIS/DAY	% OF DAYS SAMPLED WITH SEWAGE DEBRIS PRESENT
Algonquin Bridge	12	0	6	2.00	0
Snake Island	30	0	10	3.00	0
Humber Bay	299	13	11	27.18	45.45
Marina Four	5982	119	33	181.27	72.73
Rees St. Slip	10352	68	32	323.50	62.50
Bathurst Quay	5908	55	30	196.93	70.00
Ontario Place	3801	342	58	65.53	72.41

## Site Aesthetics

The aesthetic score helps quantify how pleasant a site would be to visit. Poor aesthetics (a low rating) can dissuade people from wanting to recreate at a site and are an important visual indicator for potentially poor water quality.

Aesthetics remained consistent or improved from the previous years. The Inner Harbour sites still rank the worst amongst all sites with fair ratings. All other sites were rated as excellent this year, which is an improvement for Humber Bay and Algonquin Bridge. The main factors that made the aesthetics rating lower at our Inner Harbour sites include the water colour which was often dark-green or green-brown and water surface which was often covered in litter, oil, or scum.

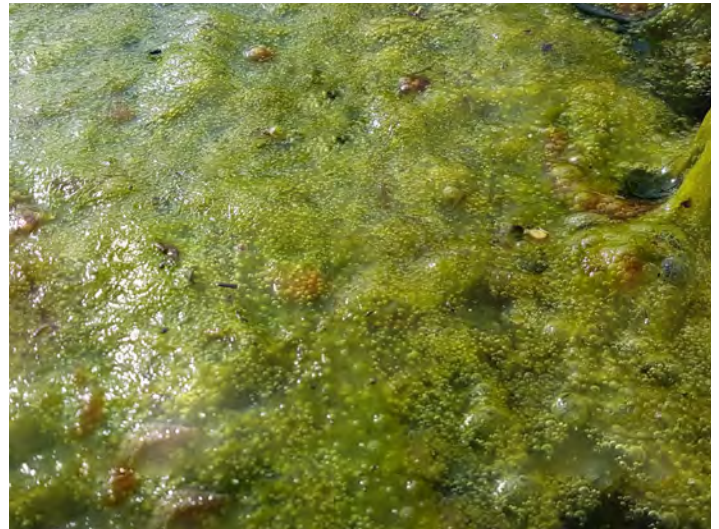
**Table 3. Summary of Aesthetics Rating for all Sampling Sites. Scores are calculated using [Aesthetic Quality Index \(AQI\)](#) established by the [Toronto and Region Conservation Authority \(TRCA\)](#). Score is calculated using four criteria: water clarity, water colour, water odour, and surface debris.**

	2018		2019		2020		2021		2022	
	Average AQI Score	Aesthetic Condition	Average AQI Score	Aesthetic Condition	Average AQI Score	Aesthetic Condition	Average AQI Score	Aesthetic Condition	Average AQI Score	Aesthetic Condition
<b>Ontario Place</b>	n/a	n/a	8.9	Good	8.9	Good	9.25	Excellent	9.04	Excellent
<b>Marina Four</b>	5.94	Poor	6.9	Fair	6.8	Fair	6.7	Fair	7.62	Fair
<b>Rees St. Slip</b>	6.78	Fair	7.0	Fair	8.47	Good	7.3	Fair	7.9	Fair
<b>Bathurst</b>	5.89	Poor	6.0	Fair	4.18	Poor	5.7	Poor	6.77	Fair
<b>Humber Bay</b>	n/a	n/a	7.9	Fair	8.87	Good	8.0	Good	9.02	Excellent
<b>Algonquin Bridge</b>	n/a	n/a	7.41	Fair	9.33	Excellent	8.3	Good	9.01	Excellent



## VAST Results

Over the course of the sampling season we completed 20 cladophora Algae surveys using [Niagara Coastal Community Collaborative's VAST tool](#), which allows community scientists to monitor changes in location-specific site health over time. We use the tool to monitor for cladophora algae at our Ontario Place sampling site, where cladophora has the potential to affect access to the water over time.



**To learn more about cladophora, check out our post [here!](#)**

90% of surveys completed reported presence of algae covering 10-25% of the site. On two occasions coverage was near 50%. The presence of algae on six occasions was associated with odour. This was the first season that the VAST survey was completed so no long term trends can be established. VAST will continue to be used in the future to develop a better understanding of how cladophora algae impacts aesthetics and recreation.

## Wildlife Trends



**Did you know? Diversity of species present at a site can be an indicator for how healthy the ecosystem is including the water.**

The diversity of species observed across the Inner Harbour remains low. Avian species made up the majority of observed wildlife (Geese, Mallard, and Cormorants). Notably, nesting Barn Swallows (a threatened species in

Ontario) were consistently observed at Rees St. Slip and Marina Four. Another notable observation was the presence of a Map Turtle at Marina Four which is also a threatened species in Ontario. The Toronto Island sites had the highest diversity of species observed, including many bird species and multiple amphibians.

We observed 20 dead animals during the monitoring season. While this is a decrease from 2022 (28 dead animals observed), this is still a persistent issue for Toronto's Harbour. Dead animals were found primarily at the Inner Harbour sites and the majority at Bathurst Quay where an abundance of dead rats were observed. Other dead species observed include muskrats, fish, and birds.



## Trends in Water Quality Parameters

At one location per site, the hub uses [Water Ranger's test kits](#) to test for pH, alkalinity, hardness, dissolved oxygen, clarity, free chlorine, and conductivity. Using the [Ontario Provincial Water Quality Objectives](#) as a guide, we found the the parameters below are of concern:

1. **Dissolved Oxygen (DO):** There is considerable variation in DO concentrations at sites temporally. There are frequent events across many sites where the DO concentration is below the 6.5 mg/L concentration suggested to support cold water biota (with the exception of Algonquin Bridge and Humber Bay). Additionally, in 2022 all Inner Harbour sites frequently recorded DO concentrations of 6 mg/L or lower. Marina Four had a recorded instance of DO concentration of four which is too low for most species of fish and other wildlife to survive.
2. **Chlorine:** Prior to 2021 chlorine had not been detected at Inner Harbour sites or at our West End sites. In 2021 chlorine was first found in the Inner Harbour and this persisted into the 2022 season where concentrations frequently reached 0.25-0.5 (µg/L). This season, chlorine was also detected at the Toronto Island sites although in very low concentrations. The Humber Bay site was the only site this season that had no chlorine detected.

Chlorine enters our water via bypasses that bring untreated drinking water into the lake. Chlorine does not naturally occur in freshwater lakes and high concentrations over time can have a negative impact on aquatic wildlife. Although the concentrations we saw this season are not high enough to be concerning, the increasing presence of chlorine in our water means it should continue to be monitored closely.

See Appendix B for table summaries of these water quality parameters for each site.

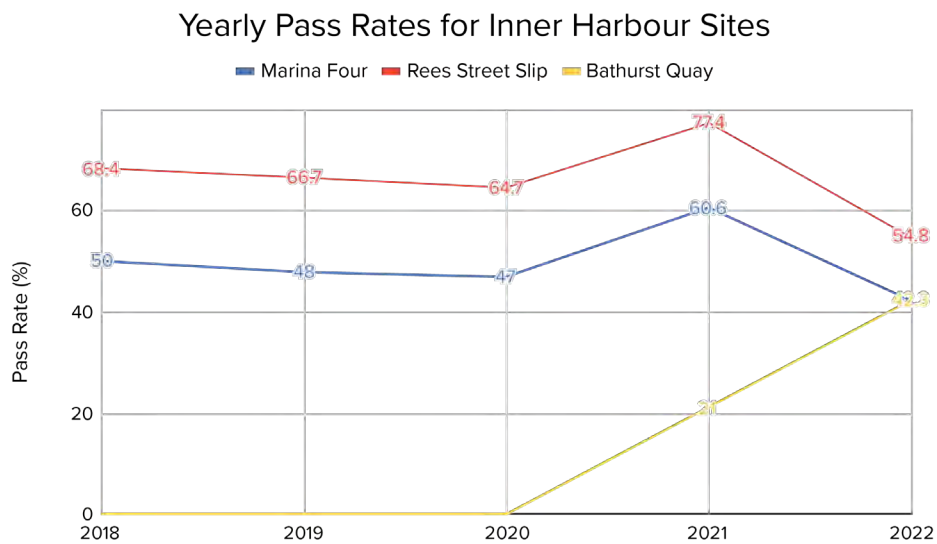


# DISCUSSION

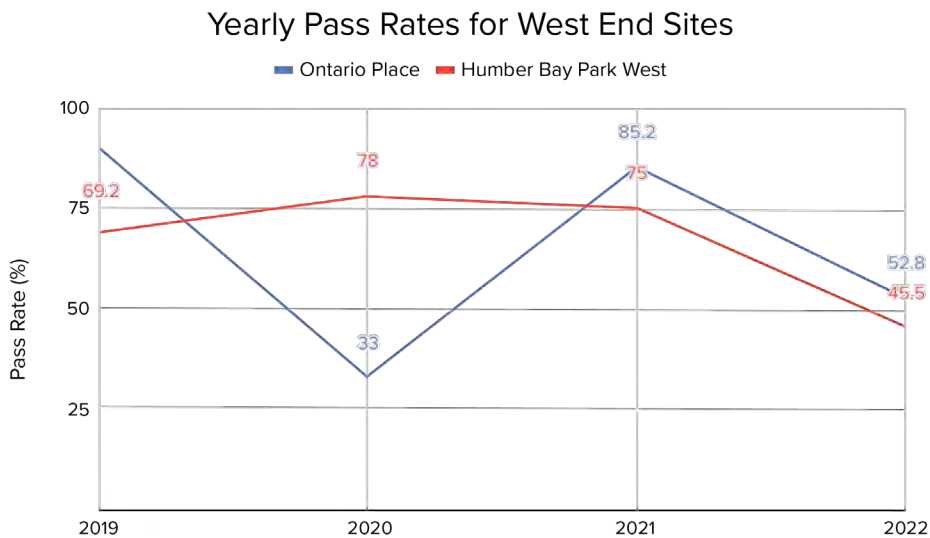
## 1. What are the long-term trends in water quality?

The Toronto Hub has been monitoring the water since 2018 consistently at our Inner Harbour sites and since 2019 at Humber Bay Park West and Ontario Place. While previous seasons suggested marginal improvement in water quality across sites, 2022 saw a reversal in many of these trends (Figure 8 and 9). We hypothesize that this variation is directly related to sewage effluent entering the water via combined sewer overflow (CSO) events. CSOs acutely affect water quality and are the most variable factor affecting Toronto Harbour's water quality.

Variation in water quality in and of itself doesn't have to be a problem for recreational water users. We expect water quality to change. This, in fact, is why we created the Swim Guide. However, variation without information on why those changes are happening makes it difficult for Torontonians to make an informed decision about when and where they can enter the water.



**Figure 9.** Pass rates for Inner Harbour sites from 2018-2022. Both Marina Four and Rees St. saw a dramatic decline in the pass rate from 2021 - 2022, whereas Bathurst Quay saw a large improvement.



**Figure 10.** Pass rates for West End sites Ontario Place West Island - South Beach and Humber Bay Park West. Ontario Place West Island - South Beach has seen no consistent trend. Humber Bay had a historically consistent pass rate, but in 2022 recorded an all-time low 45.5% pass rate.

### IS THIS VARIATION CAUSED BY RAIN?

We expect poor water quality after heavy rainfall events, so you might be wondering if our pass/fail results are dependent on when we collect samples.

While this could skew our results, the number of days we collect samples after rain events has not differed significantly year-over-year. **Instead, what we believe to be a cause for variation is combined sewers overflowing during dry weather.**

We expect combined sewer overflow events to happen during and after heavy rainfall events. This is why the City of Toronto recommends not entering the water until 48 hours after it has rained. What we don't expect, and what isn't communicated by the City, is that our combined sewers leak untreated sewage into the lake [during dry weather too](#).

### In 2022, we saw 45 Dry Day Failures across

**our sites.** A dry day failure is classified as a failure when there had been <5 mm of precipitation in the previous 72 hours. We've observed dry day failures since we first started the hub in 2018. The 45 dry day failures recorded in 2022 is more than double the amount of failures we typically see. These dry day failures are likely a contributor to the variation we've seen year-over-year.

### Why do dry day failures happen?

Dry day failures tell us that our combined sewer system is overcapacity for reasons other than stormwater entering the system.

There is no clear answer for why these happen, but any factor that adds extra water to our sewage system could be contributing to overflows. Sewer cross-connections, illegal hook-ups, buried rivers, groundwater pumping, or infiltration may all be likely culprits for causing dry day failures.

**No matter what the cause, it's worrisome that we frequently observe dry day failures. CSOs should only overflow during extreme wet weather. Dry day failures lead us to question the capacity of our system, and if we're creating more sewage than our systems can currently handle.**

### CASE STUDY: ONTARIO PLACE

Most indicative of this year-over-year variation is the water quality at Ontario Place West Island Beach. When we started monitoring the Ontario Place waters in 2019, [the water met the recreational standard 84% of the time](#), on par with a [Blue Flag](#) beach. However, we've seen huge annual fluctuations in water quality since then, with pass rates varying between 30% and 90% over the years. Along with poor water quality, we and others have observed significant sewage and floatables along the water during multiple site visits. This includes the [event](#) where over 50 condoms were found floating in the nearby water.

In 2022, we identified a nearby combined sewer outfall in the breakwall just northwest of the swimming area. This outfall was actively leaking sewage into the water during wet and [dry weather](#). Results from our sampling consistently showed extremely poor water quality results, with single sample results as high as 19,863 E. coli/100 mL (MPN).

By getting in touch with Toronto Water, we learned that these overflow events were happening because of construction on the [Western Beaches Storage Tunnel \(WBT\)](#): a piece of infrastructure which was created in 2000 to reduce the amount of untreated storm and wastewater entering the lake via combined sewer overflows. However, no notice of the construction or how it would affect the area was shared, leaving our community of water users in the dark about a potential risk of illness.

2. **Toronto’s recreational water user community is only growing stronger - especially in the West End.** As people looked to get outside during the peak of the COVID-19 pandemic we saw over a 145% increase in recreators at the sites we monitored. The majority of site use increase was observed at Humber Bay Park West and Ontario Place West Island Beach. In 2022, when most of the health mandates that were established had been removed, the number of recreational users remained high, meaning that even though we didn’t have to be outside anymore we still wanted to be.

Toronto’s recreational water community has grown. Despite this, there are no long term plans to increase access to recreational water. The West End of Toronto, where the Humber River has detrimental effects on water quality, still remains without a solution to reduce pollution from combined sewers. There are numerous small unmonitored beaches sprawled across the West End, this includes sites like Colonel Samuel Smith Park, which if monitored have the potential to support our growing community of water users..

3. **Winter recreation is popular in Toronto, yet very little water quality information is available during winter months.**

Although many people wouldn’t think to swim or use the lake in the winter months when temperatures are often below zero, there is a thriving and growing winter recreational community that actively uses the lake on a daily basis. These people include swimmers who do frequent cold plunges and surfers who take advantage of the larger wave swells we have in the winter months. This community of people are primary water users. They are exposed to the same risks as all other water users and they deserve access to the same water quality information that we all have access to in the summer.

The City of Toronto currently only monitors their official public beaches from June until early September. This doesn’t adequately provide information for the community of people who use the lake for recreation. The limited monitoring season is especially of concern when we consider our changing climate, which sees both September and October lake temperatures remaining warmer. In 2022 we recorded lake temperatures of 19 degrees celsius in late September.

This short monitoring season exposes people who recreate in the water outside of that time to a higher risk of contracting waterborne illness and also means we have little to no information about water quality over many months of the year, making it challenging to understand pollution risks and aquatic health over those months where data isn’t available.

Additionally, the City is only required to report on CSO effluent volumes from April 1st to October 31st (Source: [Sewer Capacity Assessment Guidelines \(toronto.ca\)](#)). This means we have no understanding of how much pollution is entering the water over the winter months, and with a lack of transparency on this, there is potential for pollution events to be missed which can have detrimental impacts on the environment and water quality.

4. **Floatable debris is still a concern, especially at Inner Harbour sites.**

Our findings this year are consistent with previous years that plastics and floatable debris are a significant problem for Toronto’s Inner Harbour. Work from the University of Toronto’s Trash Team conducted as part of the Floatable’s Strategy [shows us that Trash is coming from all over our waters](#). Our findings continue to suggest there is a correlation between high debris counts and poor water quality due to CSOs and stormwater runoff, meaning that CSOs are part of the problem too.

The presence of high amounts of sewage debris at all Inner Harbour sites not only contributes to lower water quality but also a decline in aesthetic condition which impedes enjoyment of the water and introduces risk to recreators if the debris is sharp or a biohazard.

# GOALS AND RECOMMENDATIONS

Each year, Swim Drink Fish sets and adjusts goals and recommendations based on the results, trends, and lessons learned from our water monitoring program, advocacy work, work with our community, and evaluation of the progress made in previous years. Our goals and recommendations help to inform the next steps for both Swim Drink Fish and our community with the ultimate purpose of working toward enhancing overall water quality and access for everyone to swimmable, drinkable, fishable waters in Toronto.

Our 2021 report highlighted six recommendations towards a [SwimmableTO](#). These goals include: working to fight floatables in the Toronto Harbour, expanding the monitoring season and number of locations, and increasing access to water in the West End. We still advocate for these recommendations and continue to work towards putting them in action.

In 2022, we want to highlight one goal:

## We need transparency around Combined Sewer Overflows.

### Why do we think this information is important?

While poor water quality is never good - and we never want to see sewage entering the water - we do recognize that eliminating combined sewers in Toronto takes time and effort. The City's [Wet Weather Flow Master Plan](#) is an excellent approach to eliminating this issue long-term. But until the plan is complete (which will take more than a decade), information should be shared on when and where pollution is entering the water.

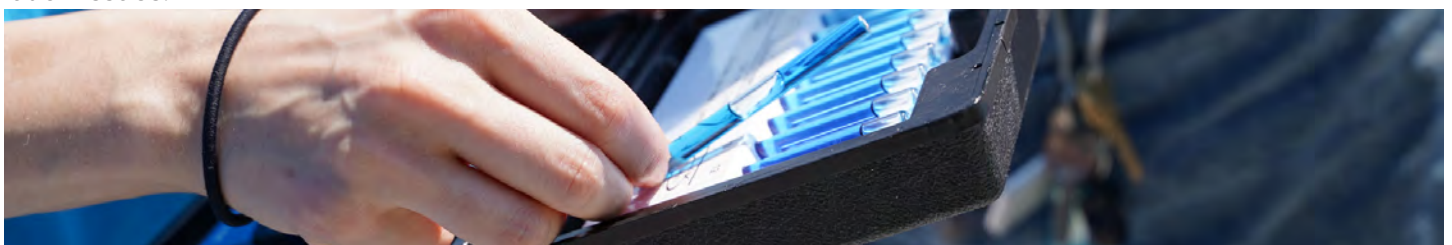
For the protection of human health and aquatic life, we have a right to know when and where pollution events are happening. The lack of transparency and communication around combined sewer overflow events is concerning, and even more so when we consider the growing number of people swimming, paddling, fishing, and boating in areas that fail to meet recreational water quality standards.

Lack of transparency around sewage pollution has been a problem for decades. Even in 2013, after [Toronto's historic 126 mm of rain](#), when we collected water samples across the city - that in some regions (like Humber Bay) contained E. coli levels that were 20 times higher than the provincial guidelines - we still saw Torontonians swimming, fishing, and wading in the water. Beyond red flags at Toronto's 11 monitored beaches, there was no warning about water quality at this time.

Failure to inform Torontonians about pollution events interferes with their ability to protect their health and the health of their families; it prevents people from knowing that their right to a healthful environment has been compromised; and, it undermines the public's appreciation for the importance of infrastructure upgrades. As a result, both short- and long-term environmental and public health protection goals are not being met.

### How do we get there?

It's one task. To reach the goal of transparency, we recommend the City of Toronto **initiate real-time monitoring of combined sewers**. Access to real-time sewage monitoring data supports the public in making informed decisions on where and when they can access clean waters. This increases water literacy and understanding about pollution problems in Ontario, supports recreational water users to make more accurate decisions on when and where they can enter the water, and helps researchers more accurately identify, locate, and work to mitigate pollution issues.





## Next Steps: What will Swim Drink Fish do?

We have always advocated for increased transparency around CSOs and will continue to do so. To address transparency and support our communities we will take the following actions:

### 1. **Continue to improve public awareness concerning sewage pollution.**

In order to continue moving towards a 'SwimmableTO' (swimmable Toronto), we must continue to empower our community to learn about and connect to our waters. Through expansion of the hub and increased collaboration with the municipality, other NGOs, and community groups, we can continue to increase the number of people participating in water literacy. We've been building on the hub's work in previous years to continue expanding our reach across Toronto.

### 2. **Work towards submitting a request for a review of the Environmental Bill of Rights (EBR) in relation to sharing information around combined sewer overflows.**

In 2014, we requested a review of the EBR to alert the public of sewage bypass events in Toronto. The review was deemed warranted, and today, this is the reason we *should* get public alerts when a bypass event happens at a wastewater treatment facilities. We would like to submit a request for review of the EBR again so we can similarly receive notifications of when and where CSO events happen in Toronto, because we deserve to know when and where these events happen.

### 3. **Continue our monitoring efforts.**

To address the increased demand for water quality monitoring and to increase transparency around water quality in the interim, we will continue to work with community groups on our 'Adopt-a-site' program which will facilitate regular water monitoring of a greater area of the waterfront.

This program provides the information and resources necessary for trained volunteers to monitor locations of their choice with the same integrity of data that Swim Drink Fish staff collect, helping us to better understand water quality in more places and increase access to water along the shoreline.

We will continue and expand our winter monitoring to include more sites for the 2023 winter season and to encourage our community-led sites through our "Adopt-a-site" program to monitor for a larger portion of the year.

## Conclusion

We're still working towards SwimmableTO, where 100% of Toronto's waterfront meets the recreational water quality standards.

The past five years of monitoring tell us that the next step towards a SwimmableTO is actually quite simple - it's letting people know when and where CSO events are happening so that they're able to make a well informed decision about when and where they enter the water. By providing clear information about why the water fails to meet the recreational standard, we can demystify Toronto's water quality, and give our community the tools they need to understand the nuance of water quality in our city.

Torontonians deserve the right to know where we're at in terms of water quality. Even though we've got some work to do, we have made strides towards swimmable, drinkable, fishable waters. There are areas where access to water is possible across the city - waterfront spaces with the potential to become community places - but until we know where and when pollution affects those sites, we remain unable to fully connect with our water, and with that, fully protect our water.

To improve transparency, we will continue monitoring so we can accommodate the city's growing demand for blue space, support Toronto's thriving recreational water community, and ensure the health and safety of our water and residents.

We're excited to continue working with the diverse and passionate community groups, organizations, and community scientists across Toronto that share our passion for connecting to and protecting our waters. Together, we have found that spreading awareness about water issues to the local community and beyond has led to a ripple effect in water literacy across the city. This helps us all effectively advocate for the health of Lake Ontario as we understand when, where, why, and how water quality changes.

# APPENDIX A

## % Pass Rates From 2018-2022

SITE	2018	2019	2020	2021	2022
<b>Marina Four</b>	50	48	47	60.6	42.4
# of times sampled	38	46	19	31	33
<b>Rees St. Slip</b>	68.4	66.7	64.7	77.4	54.8
# of times sampled	38	46	17	31	31
<b>Bathurst Quay</b>	0	0	0	21	42.3
# of times sampled	38	46	17	31	26
<b>Ontario Place</b>	n/a	90	33	85.2	52.8
# of times sampled	n/a	20	18	31	53
<b>Humber Bay Park West</b>	n/a	69.2	78	75	45.5
# of times sampled	16	13	9	12	11
<b>Snake Island</b>	77.8	100	n/a	100	100
# of times sampled	8	12	n/a	10	10
<b>Algonquin Bridge</b>	80	91.7	100	100	90
# of times sampled	9	12	7	5	10

# APPENDIX B

## Algonquin Bridge:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	20.99	15.70	23.70
Chlorine (ppm)	0.11	0.00	0.50
Alkalinity (ppm)	120.00	60.00	180.00
pH	7.72	7.60	8.00
Hardness (ppm)	67.86	0.00	150.00
Conductivity (µS)	295.50	238.00	371.00
Oxygen (mg/L)	9.29	6.00	12.00

## Humber Bay:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	17.72	10.50	23.30
Chlorine (ppm)	0.00	0.00	0.00
Alkalinity (ppm)	113.33	80.00	180.00
pH	7.88	7.60	8.90
Hardness (ppm)	133.33	0.00	150.00
Conductivity (µS)	349.67	216.00	490.00
Oxygen (mg/L)	10.08	8.00	12.00

## Marina Four:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	26.48	9.7	215
Chlorine (ppm)	0.20	0.00	1
Alkalinity (ppm)	95.15	40	200
pH	7.62	6.4	8.1
Hardness (ppm)	81.06	0	150
Conductivity (µS)	349.16	241	454
Oxygen (mg/L)	6.06	4	9

## Rees St. Slip:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	18.96	8.7	24.4
Chlorine (ppm)	0.18	0	1
Alkalinity (ppm)	96.67	40	180
pH	7.57	6.6	8.1
Hardness (ppm)	86.567	0	300
Conductivity (µS)	339.41	234	432
Oxygen (mg/L)	6.64	5	11

## Bathurst Quay:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	19.19	10.1	25.3
Chlorine (ppm)	0.19	0	0.5
Alkalinity (ppm)	92.22	60	150
pH	7.61	6.4	8.2
Hardness (ppm)	99.26	0	400
Conductivity (µS)	346.32	242	637
Oxygen (mg/L)	6.22	4.5	9

## Ontario Place:

PARAMETER	AVERAGE	MINIMUM	MAXIMUM
Water Temperature (°C)	11.67	-0.7	23.8
Chlorine (ppm)	0.17	0	0.75
Alkalinity (ppm)	95.61	40	210
pH	7.49	6.4	8
Hardness (ppm)	92.10	0	200
Conductivity (µS)	309.68	217	504
Oxygen (mg/L)	7.62	5	12