BUFFALO NIAGARA WATERKEEPER®

RIVERWATCH CITIZEN SCIENCE VOLUNTEER PROGRAM

2024 RIVERWATCH WATER QUALITY REPORT

An overview of Buffalo Niagara Waterkeeper's water quality sampling, restoration, and cleanup efforts

Image Credit: Bev Seyler
Image Description: Great Blue Heron hunts along the water

INTRODUCTION

This report is an educational tool providing information about water quality in the Western New York Region. Buffalo Niagara Waterkeeper (Waterkeeper) works to improve water quality through volunteer citizen science and cleanup programs, water quality monitoring, restoration projects throughout Western New York, and educational outreach. Included in this report is information about how the New York State Department of Environmental Conservation (DEC) creates water quality standards and stream designations, water quality issues in streams sampled, baseline water quality data, information regarding Harmful Algal Blooms (HABs), bacterial sampling results, PFAS sampling efforts, restoration project highlights, and much more!

Riverwatch is a volunteer citizen science program. Waterkeeper staff train concerned community members to gather important water quality data in the Niagara River/Lake Erie Watershed. These volunteers provide a network of 'eyes on the water' and help provide surveillance monitoring to bolster regional baseline water quality data. Waterkeeper recognizes the many barriers for full community participation in environmental volunteer programs and is continually working to reduce these barriers in our programming, including within Riverwatch.

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WATERKEEPER® ALLIANCE

MEMBER

Buffalo Niagara Waterkeeper is a licensed member of the Waterkeeper Alliance, a worldwide network of environmental organizations focused on clean water.

The Riverwatch Citizen Science Volunteer Program would not be possible without the dedication of our amazing volunteers. Thank you for the countless hours of dedication to Buffalo Niagara Waterkeeper, the Riverwatch Citizen Science Program, and to our freshwater resources!

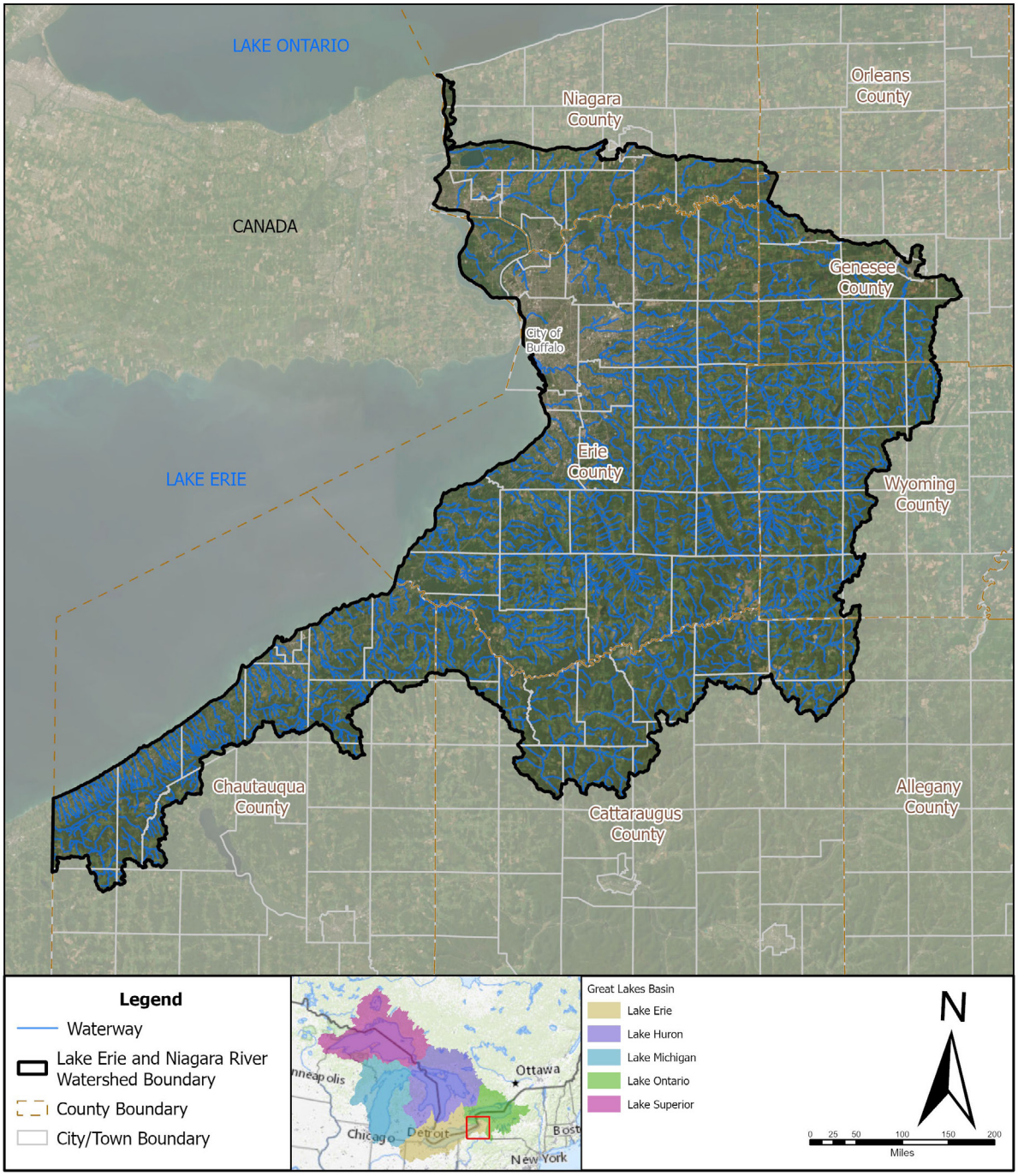
Thank you to our 2024 program supporters: East Hill Foundation, funding secured by Congressman Brian Higgins in the federal budget, and the M&T Charitable Foundation.

NIAGARA RIVER/LAKE ERIE WATERSHED

The Niagara River/Lake Erie Watershed is located along the western most portion of New York State and encompasses lands that drain into Lake Erie and the Niagara River, a channel that connects the Great Lakes of Erie and Ontario. The Niagara River/Lake Erie Watershed is one of 17 major watersheds in New York State and also part of the larger Great Lakes Basin. The Great Lakes Basin holds 21% of the world's surface freshwater resources.

The Niagara River/Lake Erie Watershed, which can be divided up into 19 smaller sub-watersheds, ecompasses 1,522,051 acres or 2,378 square miles, 5,545 miles of watercourses , and several small lakes and ponds within Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans and Wyoming counties.

To learn more about the Niagara River/Lake Erie Watershed and watershed planning visit:
www3.erie.gov/environment/watershed-management-plan



Map 1: Niagara River/Lake Erie Watershed

NEW YORK STATE WATERWAYS

Sources of information: DEC Water Quality Standards and Classifications Webpage:
https://dec.ny.gov/environmental-protection/water/water-quality/standards-classifications
Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 701 Classifications - Surface Waters and Groundwater

THE CLEAN WATER ACT AND WATER QUALITY STANDARDS (WQS)

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Water Quality Standards (WQS) are created by the DEC with oversight from the United States Environmental Protection Agency (EPA). These WQS are set by first determining best usages and establishing water quality criteria. Water quality criteria are numeric and narrative descriptions of the conditions in a waterway necessary to support Best Uses.

If all WQS are met, antidegradation policies and implementation methods are employed to keep the water quality at acceptable levels. If the waterway is not meeting WQS, a strategy to reduce pollutants and meet these standards is needed. Strategies are authorized by the CWA, utilizing available tools from federal, state, and local governments and nongovernmental organizations.

The DEC Division of Water staff oversee water quality and flood control programs throughout the state. Utilizing a number of programs, they are able to track the quality of water, identify sources of pollution, and work to control sources of pollution.

BEST USES AND STREAM CLASS

All waterways in the state are assigned a letter classification and standard designation by the DEC, which is based on the waterway's existing or expected Best Uses. Best Uses include: source of drinking water, swimming, boating, fishing, and shellfishing. There are subcategories under water-based recreation to refer to the proportion of time in which someone engaging in certain types of activities would come into direct contact with the water. Secondary contact refers to short-term contact, which may include jet skiing or canoeing. Primary contact refers to long-term or whole body contact and may include swimming, kayaking or snorkeling.

A Class A fresh surface waters

Best uses: Source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival.

This classification may be given to those waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to reduce naturally present impurities, meet or will meet NYS Department of Health (DOH) drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

B Class B fresh surface waters

Best uses: Primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival.

C Class C fresh surface waters

Best use: Fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use of these purposes.

D Class D fresh surface waters

Best use: Fishing. These waters, which reflect the lowest classification standard, shall be suitable for fish, shellfish, and wildlife survival. The water shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. Due to such natural conditions as indeterminacy of flow, water conditions not conductive to propagation of game fishery, or stream bed conditions, the waters will not support fish propagation.

Note: Waters with classifications A, B, and C may also have a standard designation of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning.

BASELINE WATER CHEMISTRY SAMPLING PARAMETERS & STANDARDS

WHAT PARAMETERS DO WE TEST FOR?

Riverwatch Baseline Water Chemistry Volunteers collect data on the following parameters using a Eureka Manta+ 20 meter and a HACH 2100Q Portable Turbidimeter.

TEMPERATURE

The temperature of water governs what aquatic life will inhabit a waterway. Additionally, temperature controls the dissolved oxygen content of water (as the temperature of water increases, the concentration of dissolved oxygen content decreases), and influences the rate of chemical and biological reactions. Water temperature can be impacted by sunlight duration and intensity, and discharges entering the waterbody.

DISSOLVED OXYGEN (DO)

DO enters water from the atmosphere, from aeration as it tumbles over rocks and falls, and from photosynthesis. DO is essential for the survival of nearly all aquatic life and levels can decrease with the introduction of various pollutants including sewage discharges, stormwater runoff, and failing septic systems.

CONDUCTIVITY

Conductivity is a measure of water's capability to pass an electrical current and indicates the presence of inorganic dissolved solids such as salts, chlorides, nitrate, sulfate, and phosphate ions. Conductivity is affected by the geology of the area through which the water flows. Elevated levels may indicate the presence of sewage or stormwater discharges and runoff. Streams outside of the standard range may not support healthy fisheries and other aquatic life.

TOTAL DISSOLVED SOLIDS (TDS)

TDS is a measure of inorganic and organic substances dissolved in water which include salts and minerals. Salts from roadways may run off into waterways resulting in an elevated TDS reading.

pH

pH is a measurement of the potential activity of hydrogen ions (H+) in a sample. The pH reading of a water sample indicates its acidity on a scale from 0 to 14 with 7 being a neutral value. Solutions with a pH less than 7 are considered acidic and solutions above 7 are considered basic. The pH of water determines the solubility and biological availability of chemical constituents such as nutrients. The majority of aquatic animals prefer a range of 6.5 to 8.5. A pH outside this range stresses the systems of most organisms and can reduce reproduction, thereby reducing the diversity in the waterway. Pollution sources can alter the waterway's pH.

TURBIDITY

Turbidity is a measure of the clarity of a liquid. Suspended solids including soil particles, algae, plankton, and microbes impact turbidity. Erosion of sediment and stormwater runoff will increase the turbidity of waterways. High turbidity increases water temperatures, decreases DO, provides refuge for harmful microbes, and can clog the gills of fish and crustaceans.

WHAT ARE THE STANDARDS FOR THESE PARAMETERS?

This report summarizes water chemistry data collected and compares it to set standards. These standards are established by the DEC with oversight from the EPA.

Standards are as follows:

Parameter	Standard
Dissolved Oxygen	No less than 6.0 mg/L for Niagara River No less than 4.0 mg/L for all other streams
Conductivity[1]	Between 150 and 500 µS/cm
pH	Between 6.5 and 8.5
Turbidity	No increase that will cause a substantial visible contrast to natural conditions

1 There is no standard set for conductivity by the DEC or EPA. This range is a guideline for freshwater systems.

Scan QR code to view data online

VIEW THIS DATA ONLINE!

To view data collected by volunteers and BNW staff in an interactive format, visit bnwaterkeeper.org/our-impact/water-quality/

ABOUT THE WATERBODIES SAMPLED

The following waterbodies are sampled by Riverwatch volunteers and Waterkeeper Staff. The stream length often includes waterbody tributaries. The water quality issues listed here reference the DEC's Waterbody Inventory/Priority Waterbodies List and Waterbody Segment Assessment Factsheets. Explore these waterways using the DECinfo Locator at www.dec.ny.gov/maps/interactive-maps/decinfo-locator

Niagara River Sub-watershed

Bergholtz Creek Stream Class: C, Length: 33.1 miles. This creek is located in Niagara County and flows into Cayuga Creek in the City of Niagara Falls. **Water Quality Issues:** Fishing, and secondary contact recreation are impaired from phosphorus and fecal coliform.

Black Rock Canal Stream Class: C, Length: 2.2 miles. This canal is located parallel to Unity Island in the City of Buffalo.

Cayuga Creek (Niagara County) Stream Class: C, Length: 21.6 miles. This creek is located in Niagara County and flows into the Niagara River near Cayuga Island. **Water Quality Issues:** Fishing and secondary contact recreation is impaired due to a presence of dioxin.

Gill Creek and Hyde Park Lake Stream Class: Gill Creek - C, Length: 12.3 miles; Hyde Park Lake - B, 28.1 acres. Gill Creek is located in Niagara County, originating on the Tuscarora Nation Reservation, flowing through the City of Niagara Falls and into the Niagara River. **Water Quality Issues:** Fishing and secondary contact recreation is impaired in the creek. Harmful Algal Blooms have been confirmed by the DEC for the past several years in Hyde Park Lake, where primary contact recreation is also impaired due to phosphorus issues.

Grand Island Tributaries Stream Class: All are class B, Length: 53.7 miles. This includes all streams on Grand Island that flow into the Niagara River. **Water Quality Issues:** Fishing, secondary and primary contact recreation is stressed due to dissolved oxygen and pH levels.

Niagara River Stream Class: A (Special - Drinking Water), Length: 36.8 miles. The Niagara River connects Lake Erie and Lake Ontario. **Water Quality Issues:** This Niagara is a source of drinking water for much of the region. Fishing is impaired due to toxic contaminants including dioxin and PCBs. The river is also a Great Lakes Area of Concern.

Scajaquada Creek Stream Class: Lower - B (mouth to Main St, Buffalo), Length: 0.3 miles; Middle - C (Main St to Cheektowaga), Length: 8.3 miles; Upper - B (above Cheektowaga), Length: 15.1 miles. This creek begins in Lancaster and flows into the Black Rock Canal in the City of Buffalo. **Water Quality Issues:** Fishing, primary and secondary contact recreation are impaired for a majority of the creek due to dissolved oxygen, fecal coliform and phosphorus.

Two Mile Creek Stream Class: B, Length: 7.1 miles. This creek flows through Tonawanda and into the Niagara River. **Water Quality Issues:** Fishing, primary and secondary contact recreation are impaired due to dissolved oxygen, fecal coliform, and oil and floating substances.

Ellicott Creek Sub-watershed

Ellicott Creek Stream Class: Lower - B (mouth to Alden), Length: 112 miles; Upper – C (above Alden), Length: 117.5 miles. This creek begins in Genesee County and flows northwest and flows into Tonawanda Creek in Tonawanda. **Water Quality Issues:** Fishing, primary and secondary contact recreation are impaired in the lower section due to phosphorus, silt, sediment, and total dissolved solids. Fishing is stressed in the upper section due to dissolved oxygen and pH.

Lower Tonawanda Creek Sub-watershed

Ransom Creek Stream Class: C, Length: 93.7 miles (includes Got Creek). This creek originates in Clarence and flows into Tonawanda Creek in Amherst. **Water Quality Issues:** Fishing and secondary contact recreation are impaired due to dissolved oxygen and fecal coliform respectively.

Tonawanda Creek, Lower (portion 1) Stream Class: C (mouth to Pendleton); Length: 11.9 miles. **Water Quality Issues:** Fish consumption is impaired, while aquatic life and recreation are stressed by known toxic contaminated sediment, urban stormwater runoff, and suspected nutrient and silt pollution from sanitary discharges and streambank erosion.

Middle Tonawanda Creek Sub-watershed

Tonawanda Creek, Middle (portion 2) Stream Class: B (Pendleton to E. Pembroke), Length 49.3 miles. **Water Quality Issues:** Fishing and secondary contact recreation is stressed due to aluminum, dissolved oxygen, pH and total dissolved solids. Primary contact recreation is impaired due to fecal coliform.

Tonawanda Creek, Middle (portion 3) Stream Class: C (E. Pembroke to Batavia), Length: 11.7 miles. **Water Quality Issues:** Fishing and secondary contact recreation are impaired due to phosphorus.

Upper Tonawanda Creek Sub-watershed

Tonawanda Creek, Upper (portion 4) Stream Class: A (above Batavia); Length: 255.1 miles. **Water Quality Issues:** Fishing, secondary and primary contact recreation is stressed due to dissolved oxygen and pH. The creek is a source of drinking water, but this use is impaired due to water level flow.

Cayuga Creek Sub-watershed

Cayuga Creek Stream Class: Lower - C (mouth to Lancaster), Length: 13.5 miles; Middle - B (Lancaster to Folsomdale), Length: 116.6 miles. This creek originates in western Wyoming county flowing into Erie County and empties into the Buffalo River. **Water Quality Issues:** Fishing is stressed due to pH in both sections while secondary and primary contact recreation is stressed in the middle section due to pH.

Buffalo River Sub-watershed

Buffalo River Stream Class: C, Length: 8.6 miles (mouth to Cayuga Creek). The Buffalo River flows through the City of Buffalo into Lake Erie. **Water Quality Issues:** The main stem is designated as a Great Lakes Area of Concern (AOC). Fishing is impaired due to PCBs.

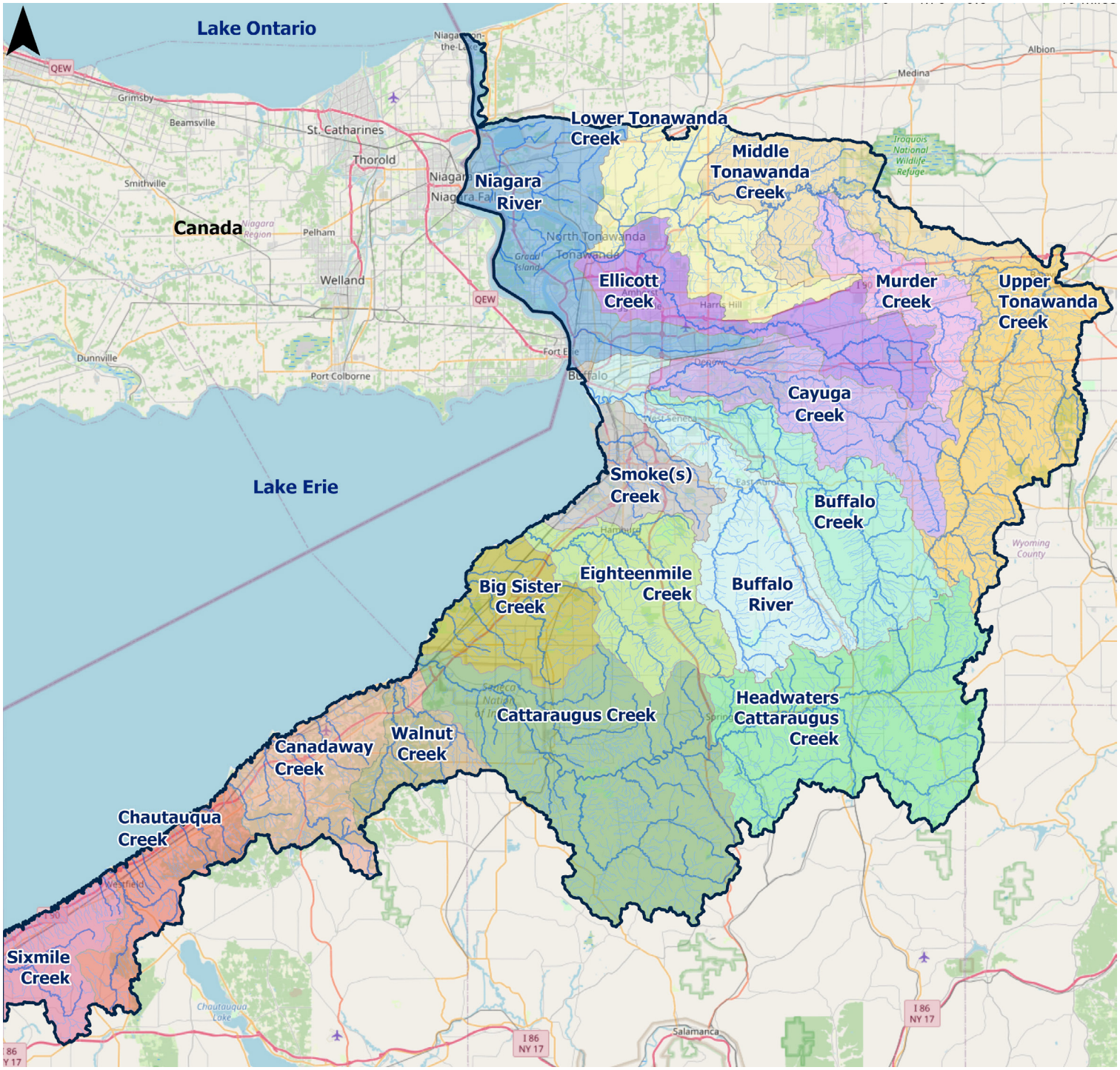
Cazenovia Creek Stream Class: Stream Class: B, Length: 51.7 miles. This creek has 2 branches which flow from the southeastern portion of Erie County. They join near East Aurora and the creek flows into the City of Buffalo and flows into the Buffalo River. **Water Quality Issues:** Fishing, secondary and primary contact recreation is stressed due to dissolved oxygen.

Lake Erie, Northern Outer Harbor Stream Class: B, Shoreline Length: 7.3 miles. **Water Quality Issues:** Fish consumption is impaired due to PCB contamination from historic industrial discharges and inactive hazardous waste sites.

Smoke Creek/Frontal Lake Erie Sub-watershed

Rush Creek Stream Class: C, Length: 17.2 miles. This creek flows in Hamburg and into Lake Erie. **Water Quality Issues:** Fishing and secondary contact recreation is impaired due to fecal coliform and phosphorus.

Smoke Creek Stream Class: Lower – C (mouth to Webster Corners), Length: 7.2 miles; South Branch Lower – C (mouth to Orchard Park), Length: 27.2 miles. This creek originates near Orchard Park, flowing through Lackawanna and into Lake Erie. **Water Quality Issues:** Urban stormwater runoff pollution elevates nutrient and sediment loads resulting in impaired/stressed aquatic life. Hydrologic modification in the main branch also impacts the creek. Fishing and secondary contact recreation is impaired in the South Branch due to phosphorus, silt and sediment.



Map 2: Niagara River/Lake Erie Watershed with Sub-watershed detail

Eighteenmile Creek Sub-watershed

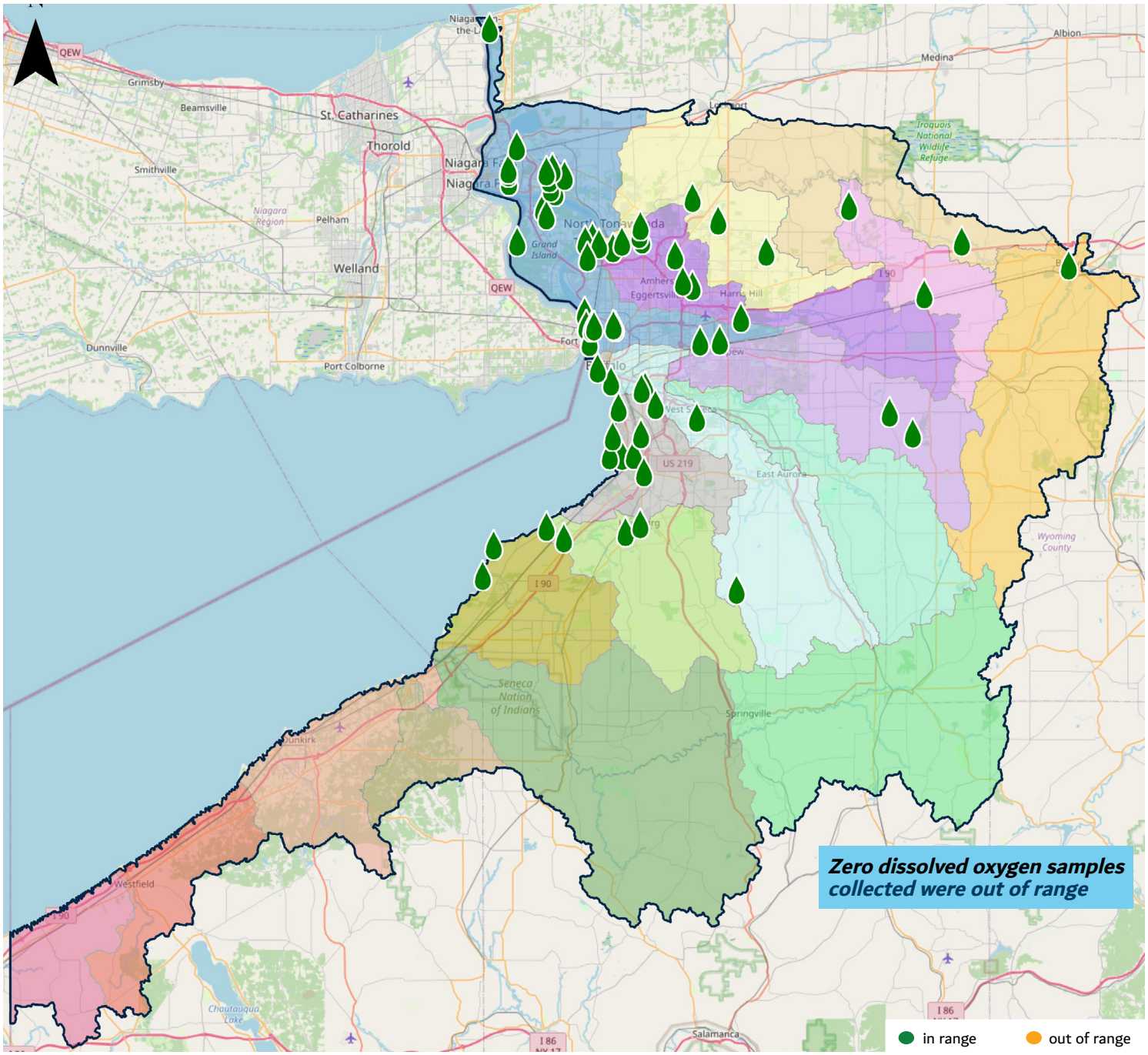
Eighteenmile Creek Stream Class: Lower - B(T) (mouth to Hamburg), Length: 30.8 miles; Middle - A (Hamburg to Patchin), Length: 49.5 miles. This creek is the second largest tributary to Lake Erie in New York State and flows through Southern Erie County. **Water Quality Issues:** In the lower stretch fish consumption, recreation, and fishery habitat are stressed by streambank erosion, stormwater runoff, agriculture, hydrologic modification, and toxic contaminated sediment. There are no known impacts listed for the middle stretch.

Big Sister Creek/Frontal Lake Erie Sub-watershed

Little Sister Creek Stream Class: Lower – B (mouth to Route 5), Length: 4 miles; Upper (above Route 5) -unassessed; Length: approximately 12 miles. This creek flows through Evans and into Lake Erie south of Cradle Beach. **Water Quality Issues:** Fishing and secondary contact recreation is impaired in the lower stretch due to fecal coliform and phosphorus. The upper stretch of the creek is unassessed.

Big Sister Creek Stream Class: Lower – C (mouth to Pontiac), Length: 19.5 miles; Upper C (above Pontiac), Length: 51.4 miles. This creek flows through Evans and into Lake Erie at Bennett Beach. **Water Quality Issues:** In the lower stretch fishing is stressed, likely due to the waterway's pH levels. Fishing in the upper stretch is impaired, likely due to waterway pH levels and copper.

DISSOLVED OXYGEN RESULTS COMPARED TO STANDARDS



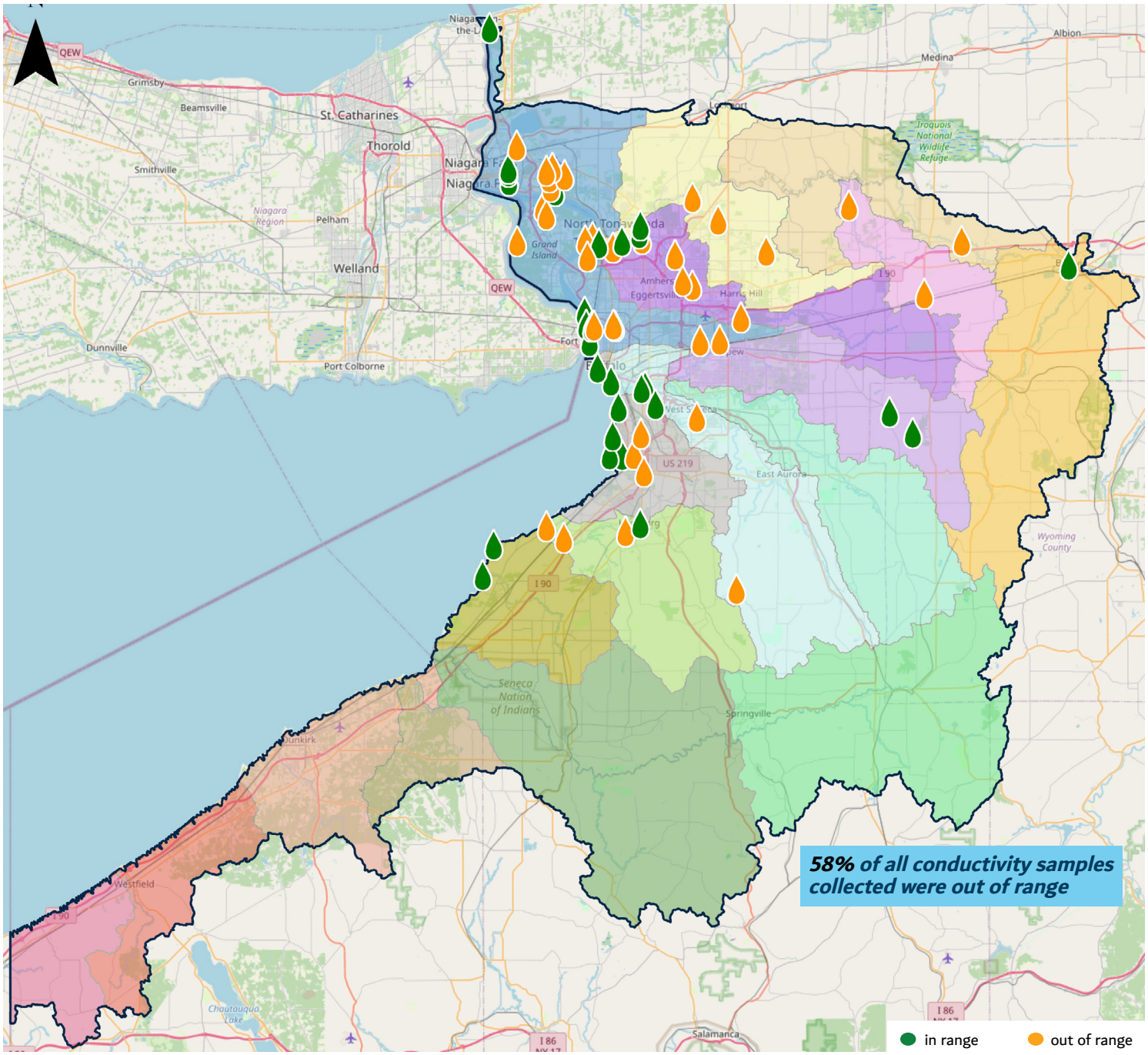
Map 3: Average Dissolved Oxygen Sample Results Compared to Standard


Eighteenmile Creek - Erie County


Mallard Ducks

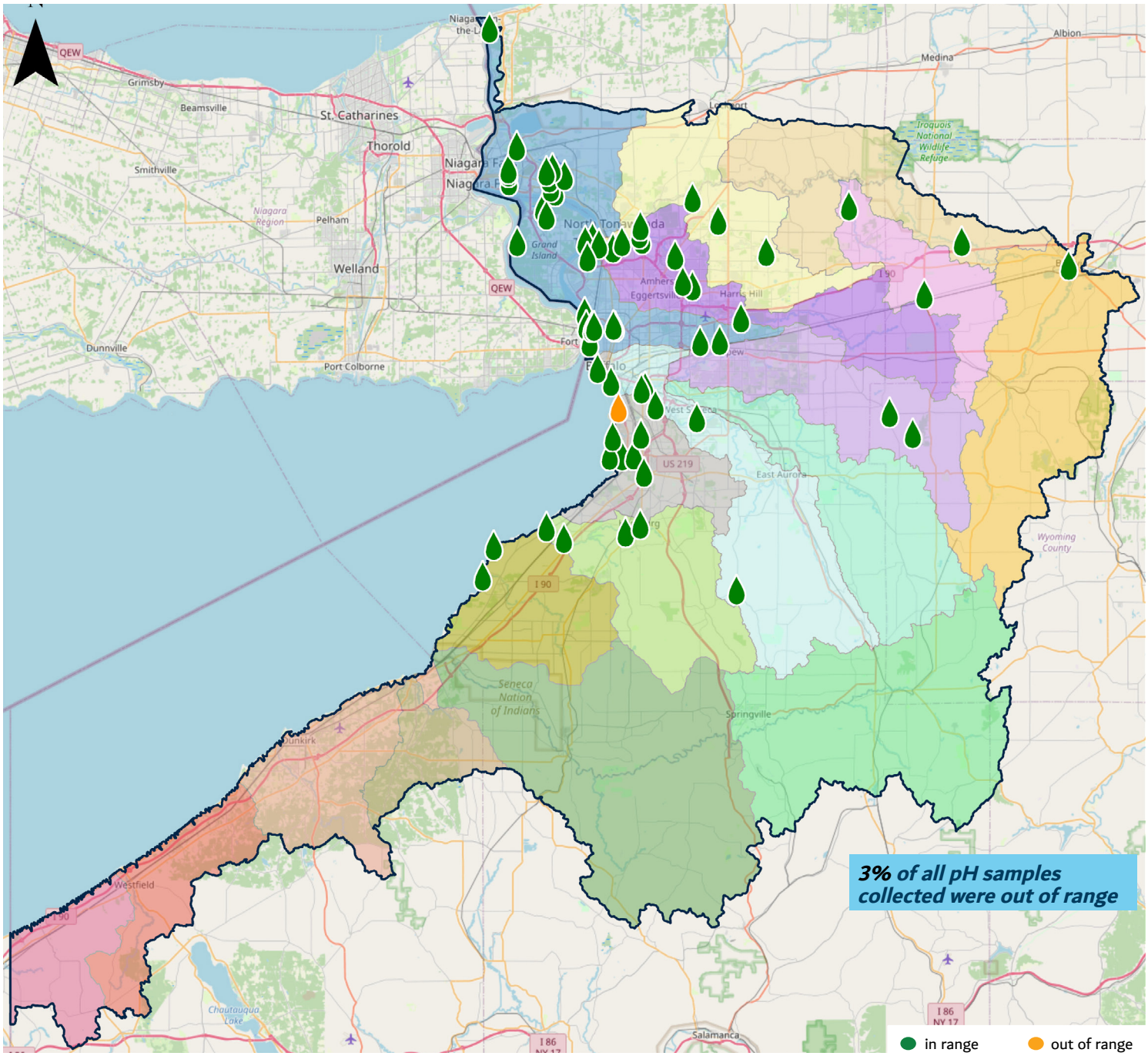

Paddles Up at Beaver Island St. Park

CONDUCTIVITY RESULTS COMPARED TO STANDARDS



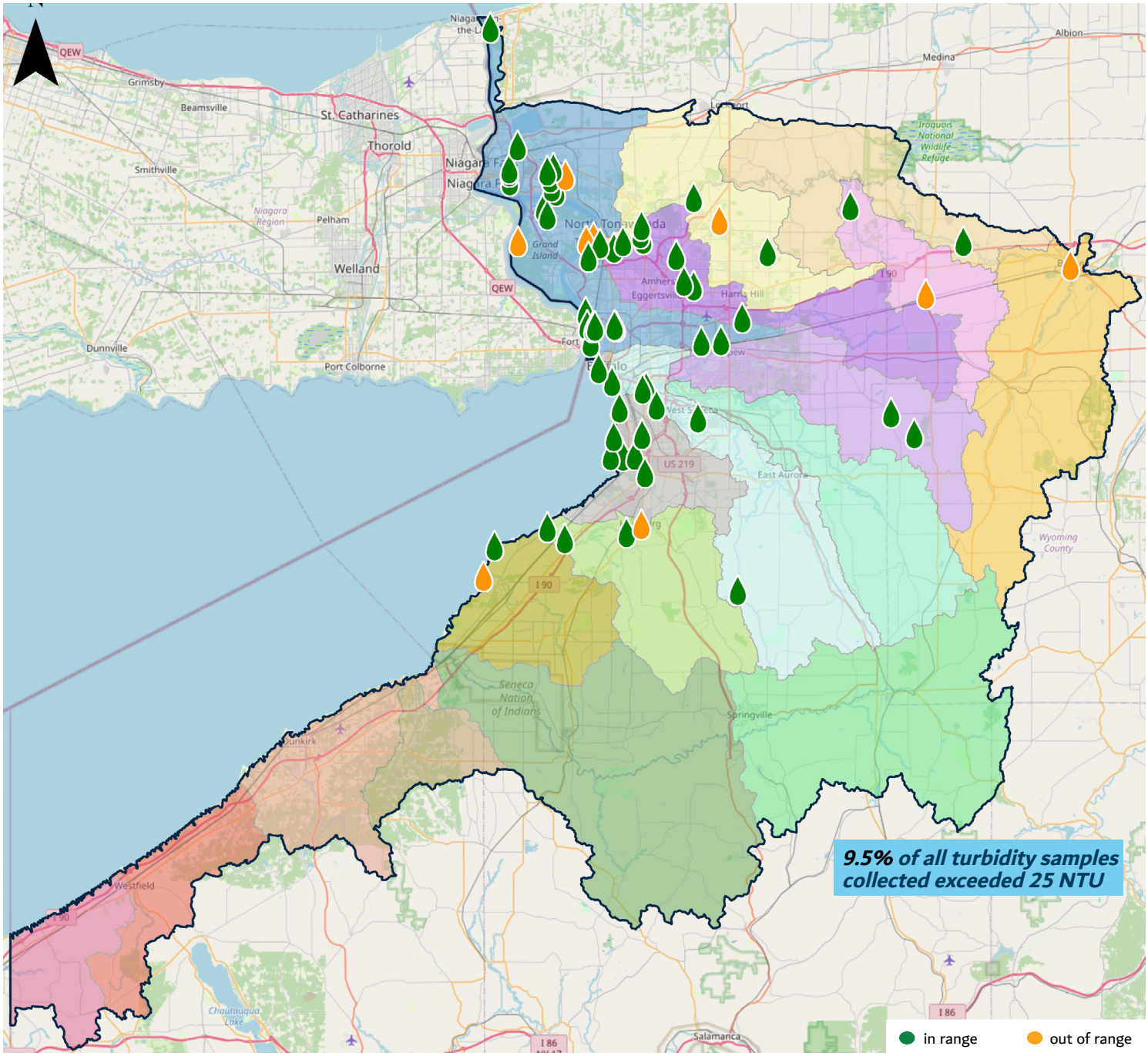
Map 4: Average Conductivity Sample Results Compared to Standard

pH RESULTS COMPARED TO STANDARDS

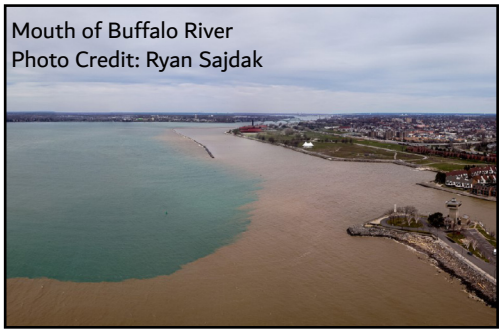


Map 5: Average pH Sample Results Compared to Standard

TURBIDITY RESULTS



Map 6: Average Turbidity Sample Results Compared to 25 NTU. NOTE: this is **not** a state standard, but a value chosen for data visualization



Mouth of Buffalo River
Photo Credit: Ryan Sajdak

Example of a turbidity scale. Photo Credit: ResearchGate.net

WNY WATERWAYS AND OUR CHANGING CLIMATE

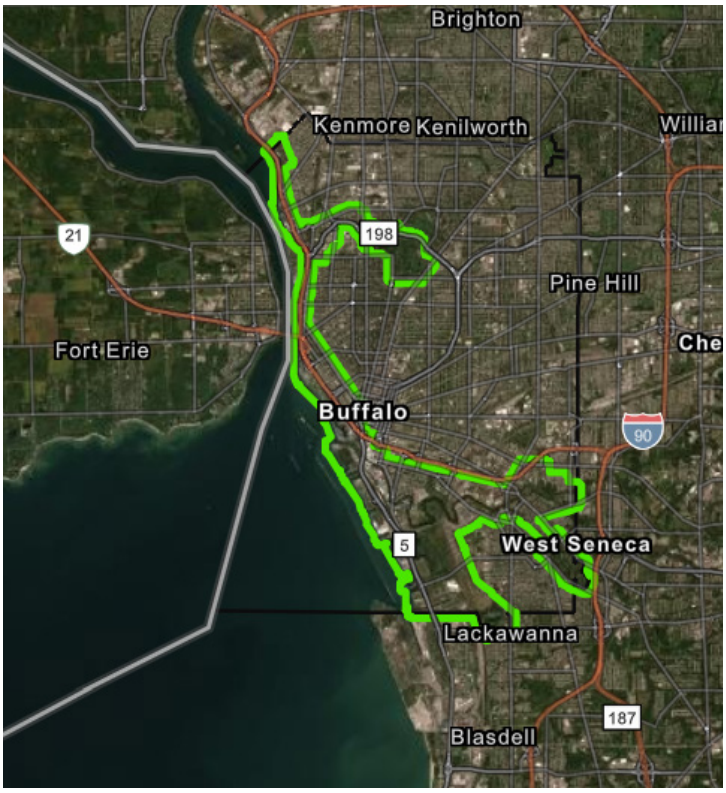
Regional Changes

The Earth's climate is changing as a result of our exponential increase in the burning of fossil fuels that we use to power our transportation systems, global energy production, and unprecedented growth of plastic manufacturing. Our region is already experiencing the effects of climate change and collectively we are experiencing significant differences in weather patterns over longer periods of time. The impacts of climate change vary across the world, and we are experiencing our own version of it locally. These changes include increased air temperatures, increased surface water temperatures, heavier precipitation, and changing winter precipitation.

These conditions lead to increased stormwater runoff, which result in erosion, flooding, and more sewage overflow into our lakes and rivers. Toxic algae blooms are on the rise, due in part to excessive run-off of nutrient-rich stormwater, and ecosystems and habitats may be permanently altered. Our region has also been experiencing increased infrastructure failure. New York State is responding to the Climate Crisis with a series of legislative actions such as the Climate Leadership and Community Protection Act, and the Environmental Bond Act to name a few.

As Lake Erie ices over in winter less frequently, the impact of seiche events on our shorelines become more severe. Seiches are created by standing waves oscillating through an enclosed body of water. When low pressure systems and associated winds progress over Lake Erie from the west-southwest, they blow along Lake Erie's longest axis, from Toledo towards Buffalo, which causes the lake to dip in the west and pile up water on the east. These events are most pronounced in the fall and winter months. When storms subside, and wind force decreases, the water piled along the coastline of Buffalo flows back into the lake, creating an oscillating wave motion as the water rocks back and forth for hours to days after the peak of the event. Seiche events can cause localized flooding and shoreline erosion due to the lack of protection from ice cover.

Waterkeeper has been working with local government and community partners to build resiliency to the impacts of climate change, like flooding and erosion, within the Western New York and Great Lakes regions. As guardians of New York's freshwater coast, Waterkeeper works to identify opportunities to enhance community resilience through policy, partnerships, and nature-based solutions.



Map 7: Coastal Resiliency Study Project Area


Coastline at Evangola State Park

Continuing our coastal resiliency work through the City of Buffalo, we have expanded assessment and analysis of the Lake Erie shoreline from the City of Buffalo to the Town of Evans. Data gathered through Ecosystem Assessment towards the Prioritization of Coastal Resiliency Projects in Lake Erie's Eastern Basin Communities is contributing to a greater understanding of the state of WNY's recreational waters to protect human health, inform pollution prevention, and identify potential priority areas for coastal and climate resiliency investments. Learn more about our work in the Eastern Basin of Lake Erie at bnwaterkeeper.org/climate-resiliency/

SCAJAQUADA CREEK RESTORATION PLAN

Recent Creek Projects

Scajaquada Creek is a spring-fed 13-mile stream within a 29-square-mile sub-watershed that begins in Lancaster, flowing through Depew, Cheektowaga and into the Niagara River via the Black Rock Canal in the City of Buffalo. Although the creek is highly impaired due to legacy and ongoing pollution, the creek continues to host a resilient ecosystem and a myriad of opportunities for restoration and community revitalization. As it flows through some of the most densely populated areas of Western New York, the creek serves as an anchor to a variety of public green spaces, even as it flows both above and underground in some areas.

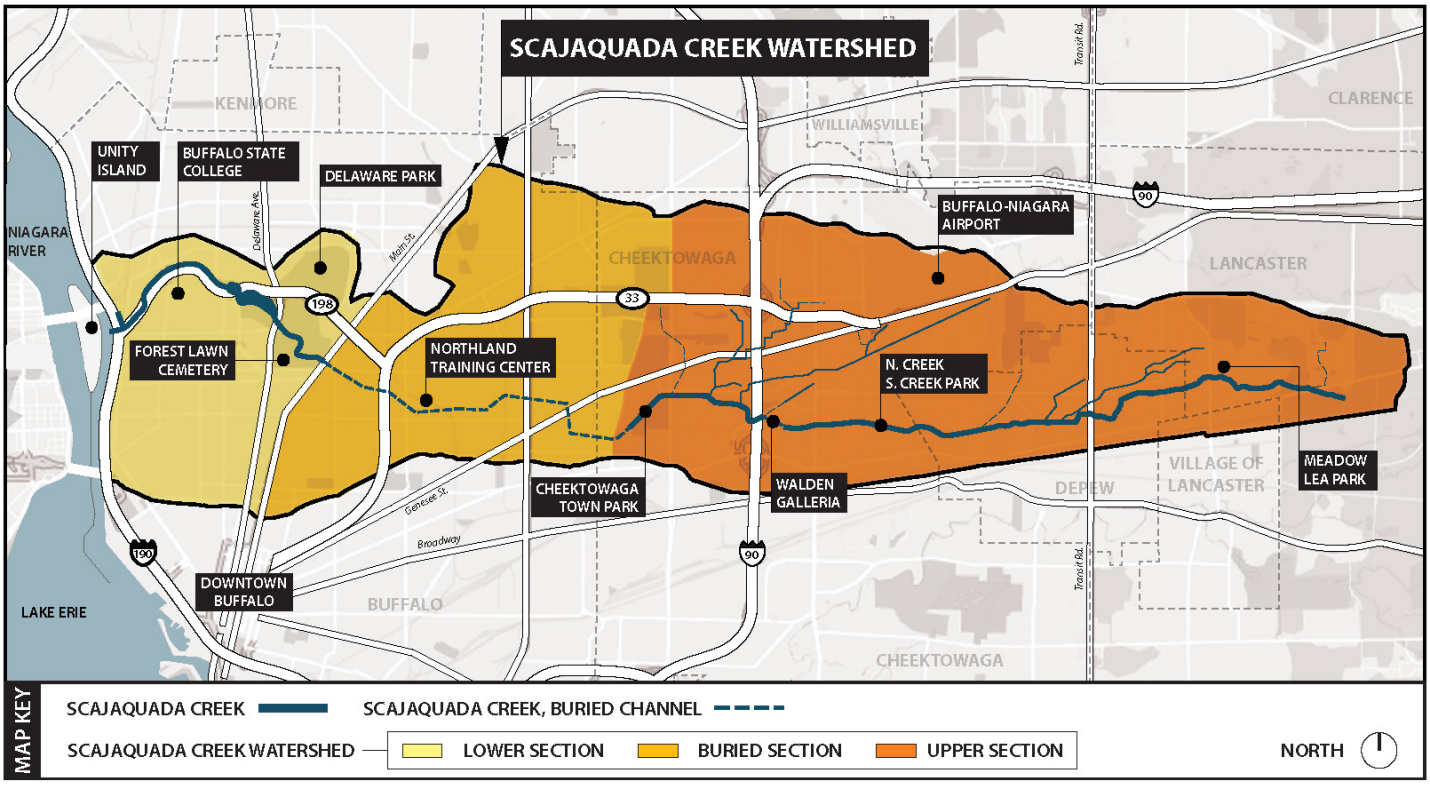
In 2020 & 2021, Waterkeeper worked in partnership with the Army Corps of Engineers and Buffalo Sewer Authority to complete the Scajaquada Wetland and Floodplain Restoration project in Forest Lawn Cemetery. These efforts transformed once bare and hardened shorelines of the creek into robust ecosystems teeming with native wetland vegetation that provides water quality benefits including flood retention, water filtration, and native wildlife habitat. In addition to the ecological benefits, each site also incorporates unique public access features and creates new and improved spaces for visitors to connect and reflect along Scajaquada Creek.

Community Involvement

In 2023, Buffalo Niagara Waterkeeper received funding from the National Oceanic and Atmospheric Administration (NOAA) to create a community-driven, watershed-wide Scajaquada Creek Restoration Plan to be completed by June 2026. The plan will serve as a resource for future decision-making by providing a technical overview of the current conditions and many projects along the creek, as well as identifying new projects and opportunities for restoration and revitalization through a robust community engagement process.

The first step in kicking off this project was partnering with several local organizations to support the development of a Community Advisory Group (CAG) to ensure diverse voices throughout the watershed are represented in the plan. The CAG is comprised of community members, local organizations and municipal representatives with the goal of uplifting those most impacted by the creek and providing a platform to be part of the plan's development process. The group meets twice a year and will continue to guide how the communities' input is incorporated into the final version of the plan, as well as support the implementation of the Outreach and Engagement Plan for this project.

For more information please visit: bnwaterkeeper.org/scajaquada



Map 8: Overview of the Scajaquada Creek Sub-watershed

HARMFUL ALGAL BLOOMS (HABs)

What is a Harmful Algal Bloom?

Harmful Algal Blooms (HABs) are excessive population growths of algae that cause harm to human health, ecosystems, or the economy. Most algae are harmless and are components of a healthy aquatic ecosystem. The algae of highest concern in Western New York are cyanobacteria, Cladophora sp., and euglenoids. Cyanobacteria blooms can produce toxins that have resulted in contaminated drinking water in Lake Erie and New York.

What Causes Harmful Algal Blooms?

HABs are likely to occur in slow moving water with excess nutrients like nitrogen and phosphorus. Warm temperatures and abundant sunlight also create ideal conditions for blooms. HABs are more likely to occur with our changing global climate.

What is the Health Risk?

HABs are harmful to people and animals. Exposure to toxins produced by cyanobacteria include stomach, skin, eye, and throat irritation, allergic reactions or breathing difficulties. If you think you are experiencing health risks associated with a HAB, consider visiting a healthcare professional. Pets should not enter water with a suspected HAB. Dogs and livestock that swim or drink water that contains microsystin and other cyanotoxins can become severely ill or die. Even after visible blooms subside, the toxins may still be present in the water.

Blooms in Lake Erie

Cyanobacteria blooms have become prevalent in the western and central basin of Lake Erie in recent years. During 2024, there were several HABs reported at and near Presque Isle State Park, located along the Lake Erie coast in Pennsylvania. Updates can be found during the year on the Department of Health's webpage: http://eriecountypa.gov/departments/health/services-and-programs/health-and-wellness/beach-water-testing-results/

For additional information, including forecast models visit: glerl.noaa.gov/res/HABs_and_Hypoxia/

Report a HAB

To report a potential bloom to DEC, fill out and submit a Suspicious Algal Bloom Report Form.
Visit their webpage:
dec.ny.gov/chemical/77118.html

You can also notify Waterkeeper by submitting a report, using the QR code below or by emailing a photo and location information to Rob Coady at rcoady@bnwaterkeeper.org

For additional information visit:
bnwaterkeeper.org/harmful-algal-bloom/

Cyanobacteria Bloom

***Euglena* Bloom**

HARMFUL ALGAL BLOOMS (HABs)

Blooms in the Niagara River/Lake Erie Watershed

Waterkeeper staff respond to HAB reports made by Riverwatch volunteers and community members throughout the year. A water sample may be collected by trained staff if deemed necessary and identified using a microscope. BNW then reports HABs to the DEC. **HABs are dangerous and should not be touched without proper training and protective equipment.**

Waterways in our watershed can experience different types of HABs. Some waterways are prone to Cyanobacteria blooms while others are prone to ***Euglena* blooms**. *Euglena* are single-celled flagellated microorganisms that feature both plant and animal characteristics. Some species of *Euglena* are known to produce ichthyotoxins. To the bare eye, *Euglena* blooms and cyanobacteria blooms look very similar. The difference is evident when looking at a sample under a microscope.

The following waterbodies in the Niagara River/Lake Erie Watershed were documented with blooms in 2024. Blooms on private property are not included. Blooms are recorded by the DEC and can be viewed here: https://dec.ny.gov/environmental-protection/water/water-quality/harmful-algal-blooms

- **Ellicott Creek** For several years, this waterway has experienced frequent and persistent *Euglena* blooms throughout the summer and fall. There is abundant public access along this creek and is a popular paddling and fishing location.
- **Green Lake** This lake, located in Orchard Park, is formed by the damming of the South Branch of Smoke Creek. The lake has bloomed in the past, and in 2024 it experienced a cyanobacteria bloom which resulted in a swimming beach closure for the season.
- **Hyde Park Lake** This man-made lake is created by damming Gill Creek. A bloom was reported to the DEC in July and confirmed. BNW was not able to collect a sample to identify the type of algae. We continue to regularly monitor this waterway along with the assistance of Riverwatch Volunteers.
- **Java Lake** A bloom was reported to the DEC and confirmed in August and again in September.
- **Tonawanda Creek** This waterway also experiences frequent *Euglena* blooms in the lower section of the creek throughout the summer months.

Euglena Bloom at Ellicott Creek - Photo Credit Ryan Sajdak

Cyanobacteria Bloom at Green Lake

How can I make a difference?

1) Reduce or eliminate the over-application of pesticides and fertilizers near waterbodies, especially if rain is forecasted within a few days of the application.

2) Encourage landowners or operators adjacent to vulnerable waterbodies to not mow to the water's edge, allow for a buffer zone of vegetation to help filter surface run-off into waterways.

3) Advocate to our elected officials about your concern about HABs and the need for more monitoring, testing, and projects that can help alleviate this growing problem.

4) Report the problem.

5) Make a donation to BNW to support programs like Riverwatch, which samples for HABs and other threats to our waterways and keeps the public informed.

BACTERIA SAMPLING

Bacteria Basics

Bacteria are single-celled organisms naturally found in the environment. Some bacteria are harmless to humans and can actually help aid natural processes. *Escherichia coli (E. coli)* is a bacterium found in the environment, foods, and intestines of people and animals. Many strains of *E. coli* are harmless to humans. However, some strains can result in serious health problems and sickness. *E. coli* is a strong indicator of sewage pollution or animal waste contamination when found in local waterways.

Combined Sewer System 101

Most older cities and municipalities in New York State, including the cities of Buffalo and Niagara Falls, have combined sewer systems. In contrast, most outlying suburban areas utilize separate storm and sanitary sewers.

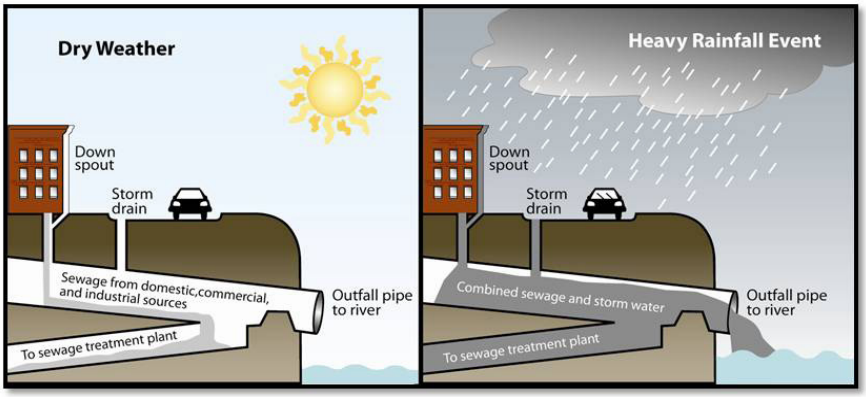


Image: EPA

During rain events in a combined sewer system, water from streets, roofs, and lawns flows into storm drains and combines with sewage in one system. When there is heavy rainfall, the volume of water overwhelms the system and overflows into local waterways by design. These overflows are referred to as Combined Sewer Overflows (CSOs). These overflows contain not only stormwater, but untreated human waste, toxins, and debris. When improperly maintained, septic systems also have the potential to discharge bacteria and pathogens into area waters.

Sampling

Waterkeeper staff sampled 34 sites during 2024 between the months of May and November for *E. coli* bacteria. Locations were selected based on the presence of combined sewer outfall pipes nearby or the presence of a kayak launch. Some sites were not sampled each month due to access issues or weather related events. Samples were analyzed using the R-CARD® Rapid Test Method. Samples were collected during a dry weather period and a wet weather period. Some months only allowed for the collection of samples during either dry weather or wet weather.

- **Dry Weather Period:** A water sample can be collected at the sample site if there has been no rain in the past 3 days.
- **Wet Weather Period:** A water sample can be collected at the sample site during a rain event or immediately after a rain event. A qualifying rain event is 5 hours of rain OR ½ inch of rain at the sample site.

Example of CSO Signage along the Buffalo River

Results

Sampling results were compared to the EPA's Beach Action Value (BAV) of 235 cfu/100mL. This value is often used for making beach notification decisions (i.e., closures or advisories). As seen in Figure 1 on the following page, higher levels of *E. coli* are typically recorded during wet weather periods versus dry weather periods. It continues to be very common for sampling sites to exceed the BAV after wet weather events. If there are frequent dry weather exceedences, Waterkeeper will often conduct additional sampling and notify the municipality.

Caution should be made when recreating in local waterways during, or soon after, wet weather periods. Waterkeeper will continue to conduct bacteria sampling of local waterways to better inform community members of waterway conditions and to track down pollution sources.

These results were uploaded to Swim Guide, a website and app that presents free water quality information for over 10,000 possible swimming and water recreation locations in multiple countries. Explore Swim Guide today at www.theswimguide.org/ To view detailed sampling results visit bnwaterkeeper.org/our-impact/water-quality/

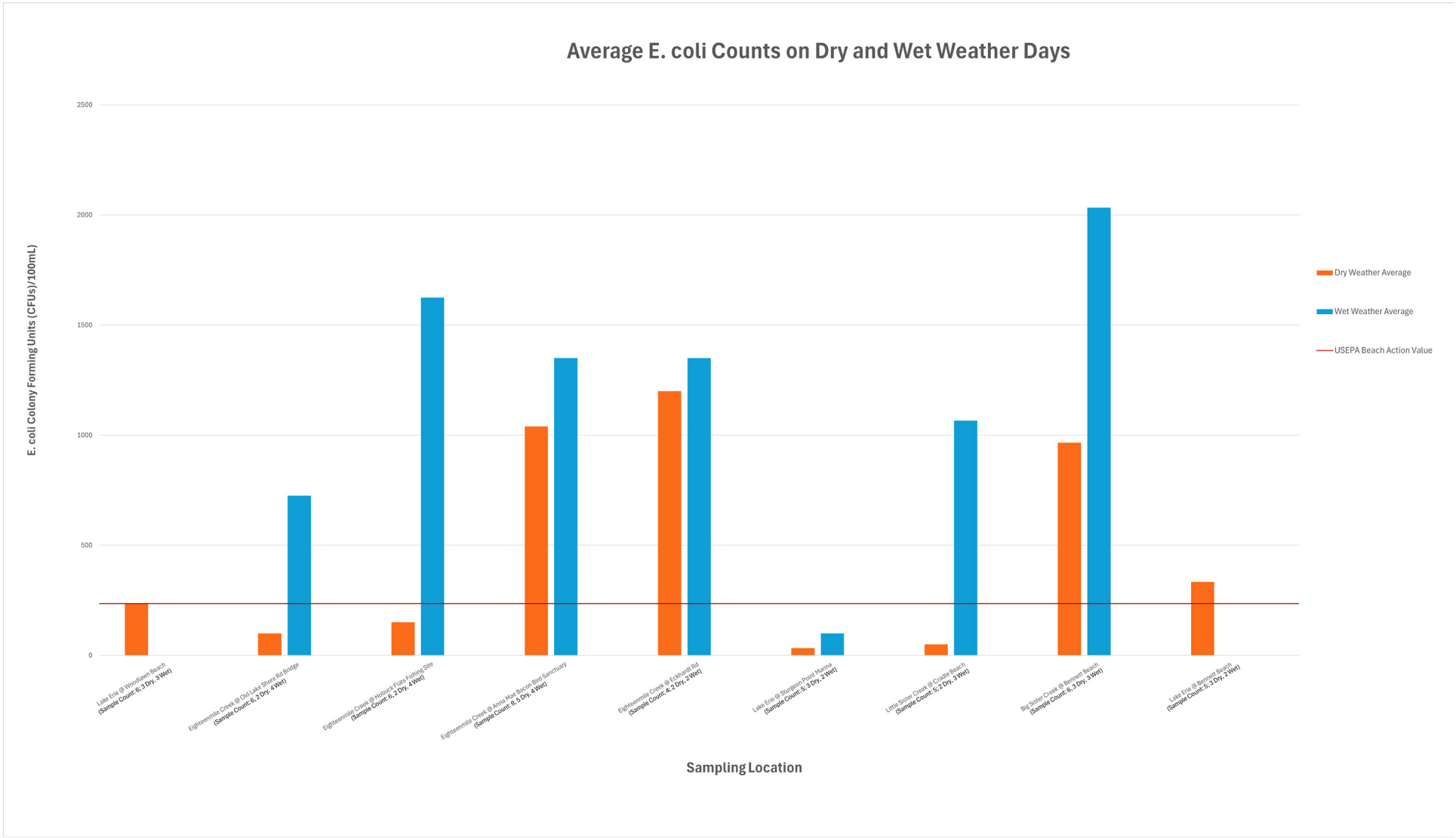


Figure 1: *Escherichia coli* results in comparison to the EPA BAV

PFAS SURFACE WATER TESTING

What are PFAS?

PFAS, or Per- and polyfluoroalkyl substances, are a large, diverse class of man-made chemicals. There are over 15,000 PFAS chemicals, often referred to as 'forever' chemicals because they do not naturally break down. Exposure to these chemicals have been linked to a variety of health effects including cancer, liver damage, decreased fertility, and others. Learn more about PFAS at bnwaterkeeper.org/pfas-pfoa-pfos/

Image source: torrentlab.com/pfas-testing/

PFAS and Drinking Water

Experts estimate that more than 200 million Americans are exposed to PFAS through drinking water.[1] In April of 2024, The EPA issued the first-ever National Primary Drinking Water Regulation for 6 PFAS chemicals, including 2 of the most toxic types, PFOS and PFOA.[2] The standard being set for these 2 types of PFAS is a Maximum Contaminant Level (MCL) and is set at 4 parts per trillion (ppt) for public water supplies. The EPA has also set MCLs for four additional PFAS not currently regulated in New York State. These water suppliers must comply by 2029. Currently the NYS Department of Health (DOH) regulates these 2 PFAS with a MCL set at 10 ppt for public water supplies. The DOH will soon finalize regulations for 23 additional PFAS chemicals. Read more about the DOH's actions on PFAS here: www.health.ny.gov/environmental/water/drinking/emerging_pfas_publicwater.htm

PFAS and Surface Water

Surface waters currently lack protections from PFAS chemicals. Experts estimate that nearly 30,000 facilities discharge PFAS into surface waters in the US.[3] These discharges are currently unregulated, as the EPA has not designated any PFAS as hazardous substances under the Clean Water Act. Read more about the EPA's actions on PFAS here: www.epa.gov/pfas/key-epa-actions-address-pfas

New York State is making progress toward regulating PFAS discharges into waterways. In January 2024, the DEC released Draft Guidance Related to Discharges of PFOS, PFOA and 1,4-Dioxane. This guidance provides an initial implementation strategy for applying guidance values into State Pollutant Discharge Elimination System (SPDES) permits for Publicly Owned Treatment Works. These guidance values were finalized in 2023. Read more about the DEC's Actions here: https://dec.ny.gov/environmental-protection/water/emerging-contaminants

PFAS Surface Water Sample

Starting in 2022, Waterkeeper began collecting surface water samples from waterways in Western New York. To date we have collected samples from 18 different waterways throughout the watershed. To the right is a chart showcasing some of the various PFAS. For more comprehensive results visit: bnwaterkeeper.org/pfas-pfoa-pfos/

1 ewg.org/news-insights/news-release/study-more-200-million-americans-could-have-toxic-pfas-their-drinking
2 https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas
3 ewg.org/news-insights/news-release/2021/07/twelvefold-increase-suspected-industrial-dischargers-forever

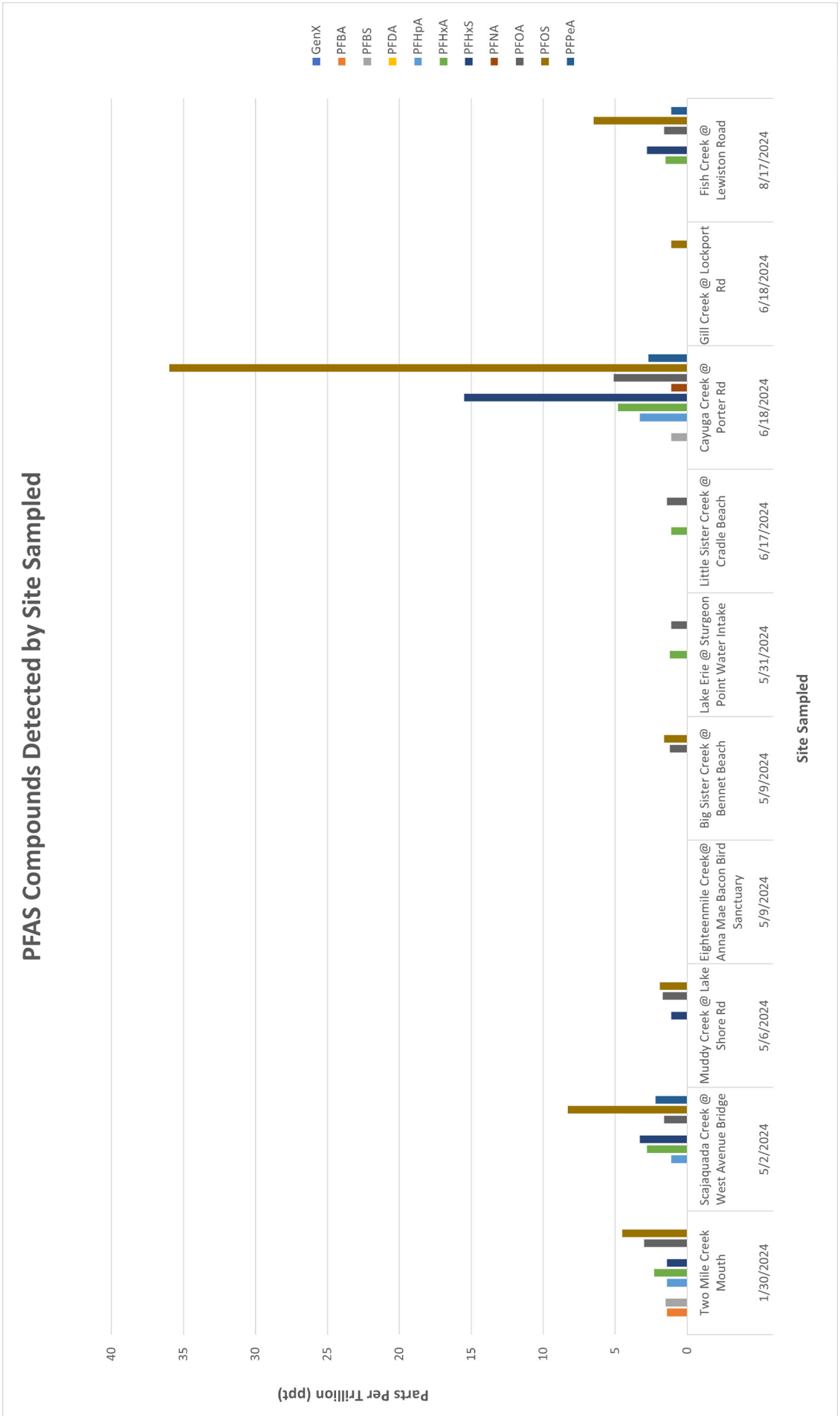


Figure 2: Some of the various PFAS compounds detected at various waterways sampled throughout 2024

RESTORATION PROJECT HIGHLIGHT

What is a Living Shoreline

Starting in 2013, Waterkeeper has been transforming degraded shorelines throughout WNY utilizing innovative methods and approaches. This restoration is greatly needed as much of the shoreline habitat has been greatly altered from its natural state. These shoreline restoration projects enhance water quality, habitat integrity, and natural functions, while transforming the sites to a more resilient, self-repairing form. Characteristics of Living Shorelines include gradual natural slopes, native and naturalized plant species, and other natural materials that help to buffer the shore from storm effects and hydrologic forces. Learn more about the Living Shorelines Program here:
bnwaterkeeper.org/living-shorelines/

Ellicott Island Bark Park

The Ellicott Island Bark Park is part of Erie County Parks and is located in the Town of Tonawanada. The island is surrounded by Tonawanda Creek and functions as an off-leash dog park. The shoreline of the park's southern end had been severely degraded and actively eroding due to persistent boat wakes in the summer and high foot/paw traffic which resulted in vegetation loss. This erosion of sediment was contributing to high levels of turbidity in the creek.

Primary project partners included Erie County, Friends of Ellicott Creek Bark Park, WSP Inc., and LDC Construction.

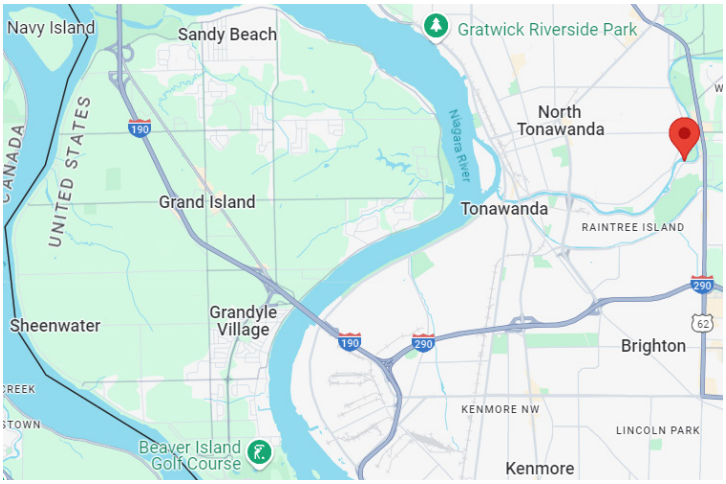
Construction began in spring 2024, with many plantings occurring during late summer and fall after the heavy earth-moving was complete. A few minor plantings are scheduled for spring 2025, which will mark the end of project construction and the beginning of project establishment.

Restoration measures included:

- Re-engineering of 15,000 sq. ft. of shoreline and riparian areas.
- Installation of in-water barrier rock reefs to create protected aquatic planting zones along the shoreline of the island.
- Regrading of the slope to allow stormwater runoff to be captured on site rather than run quickly into the creek.
- Creation of a stabilized water egress for dogs that preserves sensitive shoreline habitat areas, limits erosion, and reduces sediment disturbance.

Learn more about this project at:
bnwaterkeeper.org/ellicott-island-bark-park/

Major funding for this project was provided by the New York Power Authority through the Greenway Ecological Fund and the Habitat Enhancement and Restoration Fund. Additional funding was provided through an agreement with Cornell University in partnership with New York Sea Grant under Prime Agreement CM04068 from the New York State Department of Environmental Fund, Cornell University in partnership with NY Sea Grant.



Map 9: Project Location

Pre-construction: Site conditions as of 2019

Post-construction: Site conditions as of fall 2024

NURDLE PATROL

Tiny plastic pieces create big problems for aquatic ecosystems

What is Plastic?

Found in many forms in our everyday life, plastic is a lightweight, durable material that can be made into almost anything. Plastics are polymers, which are modeled after naturally occurring polymers like in hair, skin, and DNA. Most plastic is made of synthetic polymers derived from fossil fuels, a non-renewable resource.

Plastics degrade over time. This process is accelerated when the plastic is exposed to heat, light, chemicals or natural processes. Chemical additives are often mixed into the plastic polymer to slow this breakdown. These additives are not chemically bound to the polymer and they can leach out into the environment in certain conditions.

More Plastic, More Pollution

Plastic use and production has increased over time, specifically in the Post-World War II era with increased consumerism and the mass production of goods. Currently, nearly 8.8 billion pounds of plastic is produced each year, of which less than 10% is recycled.[1] By 2015, humans had generated 8.3 billion tons of plastics.[1] The negative impacts can be seen worldwide, specifically in water ecosystems, with numerous species of birds, turtles, and fish becoming entangled in or ingesting plastic material. Often, the plastics being ingested are tiny microplastics, smaller than 5mm in length. Studies have estimated that microplastics make up approximately 90% of plastic pollution in marine environments.[2] In addition to the plastic pollution at the end of the material life cycle, the generation of plastic materials contributes to atmospheric pollution and relies on non-renewable fossil fuels. New ethane cracker facilities and existing petrochemical plants are often located in poor, minority communities, contributing to environmental justice challenges.

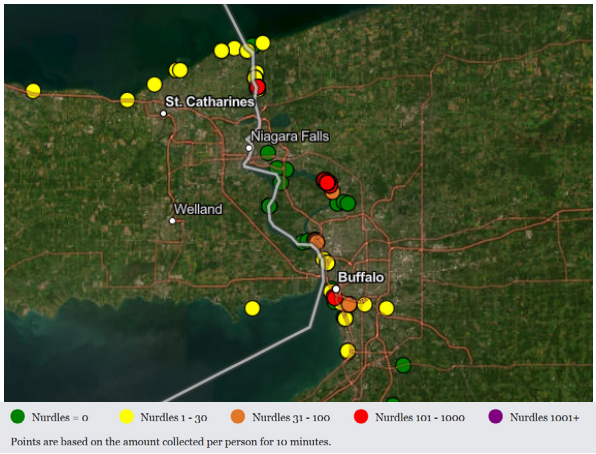
Nurdle Patrol Efforts

Nurdles are plastic pellets, about the size of a lentil, that are the raw material used in the manufacturing of plastic products. Nurdles get shipped around the world via ship, train, and truck to plastic manufacturers. Nurdles have been known to spill due to transport issues or escape through holes in shipping containers. The small, lightweight nurdles can then be blown by the wind, washed away down storm drains, or directly into waterways.

In the summer of 2020, a large concentration of nurdles was documented along the banks of the Niagara River in Gratwick Park in North Tonawanda. After this discovery, Waterkeeper joined a larger North American wide citizen science project known as Nurdle Patrol. To learn more about this project visit: nurdlepatrol.org

In 2024, over 1,100 nurdles were collected locally and the data was uploaded to the Nurdle Patrol Project. The majority of these nurdles were collected along the Niagara River shoreline at Gratwick Park in North Tonawanda. Waterkeeper was able to train 28 additional volunteers on the nurdle patrol data collection process.

NURDLE PATROL.org



Map 10: Map showing distribution of nurdles collected

Take Action!

The Great Lakes system, which includes the Niagara River, provides drinking water for nearly 40 million people, including nearly 1 million residents here in Western New York.[3] To protect our water resources, wildlife, and human health, the production of plastics intended for wasteful single-use applications must be reduced. Individuals can conduct an audit of the plastics used in their daily life, and can also advocate to elected officials to support policy that limits the production of single-use plastics.

If you are interested in joining Waterkeeper in our Nurdle Patrol efforts, send an email to Liz Cute at ecute@bnwaterkeeper.org so you can be informed about future training opportunities.

Nurdles and other plastics litter the Niagara River shoreline

1 https://www.unep.org/interactives/beat-plastic-pollution/
2 https://www.epa.gov/trash-free-waters/science-case-studies
3 https://www.epa.gov/greatlakes/great-lakes-facts-and-figures

CLEANUPS

Spring Sweep & Great Lakes CleanUP

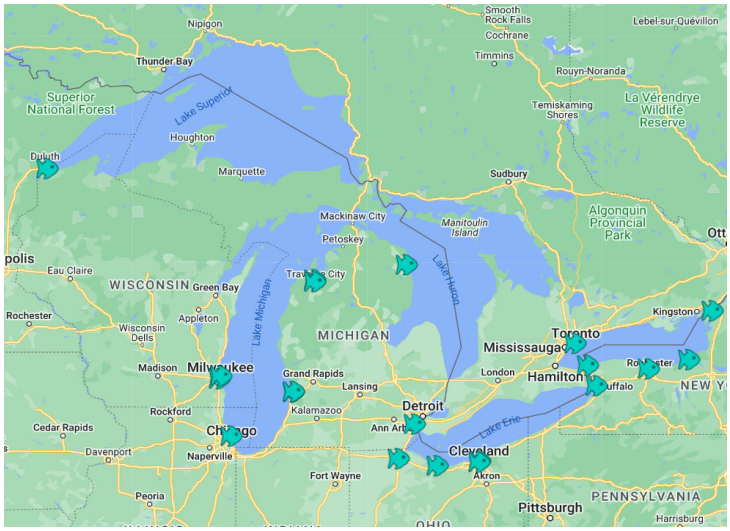
The 2024 Spring Sweep was part of the 4th Great Lakes CleanUP! Waterkeeper initially received federal funding from the EPA Great Lakes Restoration Initiative in 2021 to launch and coordinate this watershed-wide trash removal event in the spring to protect local waterways and strengthen collaborative efforts throughout the Great Lakes. Since then, Waterkeeper has continued to grow this partnership each year, connecting with 17 locally based organizations who organize cleanups in their regions to remove litter and encourage data collection. In 2024, **7,103 volunteers** throughout the Great Lakes participated and collected data on **119,374 pounds of litter** that was removed across all 5 Great Lakes.

In Western New York, over **1,200 volunteers** participated in Waterkeeper's Spring Sweep, part of the Great Lakes CleanUP. Together these volunteers collected **10,657 pounds of litter**. Volunteers were encouraged to input data on litter collected into the Ocean Conservancy's Clean Swell app. Over 41,000 pieces were recorded! Of these items recorded in Clean Swell, 86% were plastic.

The total numbers collected are staggering!
- **8,111 cigarette butts**
- **5,012 plastic/foam pieces**
- **4,339 food wrappers**
- **1,832 other plastic waste**

The stewardship efforts of volunteers also support Waterkeeper's advocacy work through the power of data collection.

Learn more about the Great Lakes CleanUP at greatlakescleanup.org/



Map 11: Locations of 2024 Great Lakes CleanUP partners

Solo Sweeps

Our Solo Sweep Program continued in 2024, gaining nearly 100 new supporters. The number of Solo Sweeps recorded this year reached over 270, with 39,000 pieces of litter being recorded in the Clean Swell app.

This data, recorded by solo sweep volunteers, is critical to plastic pollution prevention advocacy and magnifies the impact beyond the removal effort. Clean Swell data is stored on the largest litter database in the world, TIDES, which is used by educators, scientists, and decision makers to advocate for policies that protect clean water.

Learn more about the Solo Sweep Program, and sign the pledge here: bnwaterkeeper.org/cleanups/


Spring Sweep volunteers celebrate a job well done along Cazenovia Creek

A look at the Clean Swell App interface

SOLUTIONS TO ONGOING POLLUTION

Below are three different ways you can reduce pollution in your life.

Downspout Disconnection

Downspouts on many homes are connected directly to the sewer system, contributing to sewer overflows. By disconnecting downspouts from the sewer system, water is able to drain to lawns or gardens, thereby allowing water to soak slowly into the ground as plants and soils filter out pollutants.

Rain Barrels

Rain barrels are containers that collect and store rain water for future uses (like watering a garden) while decreasing the amount of stormwater runoff that leaves your property. A rain barrel is placed under the downspout to channel rainwater into the barrel for later use. Learn more:
bnwaterkeeper.org/rainbarrels/

Reduce Single-Use Plastic Use

Plastic continues to litter our waterway shorelines and communities. By switching from single-use plastic items to reusable wherever possible, you can help reduce plastic pollution! Another way to help is to call your elected officials and let them know you support legislation that limits single-use plastic pollution! Learn about more tips to reduce plastic waste here:
bnwaterkeeper.org/less-plastic/

PREVENT POLLUTION WITH BUFFALO NIAGARA WATERKEEPER

Waterkeeper hosts various volunteer events to clean up local waterways and prevent pollution.
For additional information on these events and our other programs, please visit our website - bnwaterkeeper.org

Cleanups

Help support Buffalo Niagara Waterkeeper's mission to protect and restore our water by participating in a Solo Sweep – anywhere, anytime that works for you! Pick up litter, record the data, and join us in advocating for clean water here in Western New York and throughout the Great Lakes region.
Get involved:
bnwaterkeeper.org/cleanups/

Volunteer Ambassador Program

The Volunteer Ambassador Program raises community awareness of water pollution issues in Western New York and direct actions to reduce pollution. Ambassadors are highly trained volunteers who represent the organization at various community, school, and organization events and programs. Learn more:
bnwaterkeeper.org/ambassadors/

RestoreCorps

Learn about riparian and park reforestation and adaptive management of shoreline restoration sites while helping reduce stormwater runoff from entering local waterways. Join a future native planting event and check out our resources at:
bnwaterkeeper.org/restorecorps/

OUR WATER.
OUR FUTURE.

BUFFALO NIAGARA WATERKEEPER®

Water defined Buffalo's history and clean water will shape Western New York's future. Gifts made to Buffalo Niagara Waterkeeper allow us to continue to protect clean water, restore the health of ecosystems, connect people to water, and inspire economic growth and community engagement.

PLEASE DONATE TODAY.

WE CAN'T DO THIS WORK WITHOUT YOUR SUPPORT.

BNWATERKEEPER.ORG/SUPPORT