

The Niagara River/Lake Erie Basin

Basin Description

The Niagara River/Lake Erie Basin is located in western New York State; in fact, Lake Erie and its outlet – the Niagara River – represent the western boundary of the State. At the point where the Niagara River/Lake Erie Basin empties into Lake Ontario, the larger Great Lakes basin encompasses more than 265,000 square miles of the north central United States and south central Canada. The drainage area beyond the borders of New York State includes four of the five Great Lakes, as well as some of the largest, most urban/industrial cities in North America. Within the borders of New York State, the Basin drains approximately 2,380 square miles of northern Appalachian Plateau and lake shore lowlands. The New York State portion of the Basin includes all of Erie County and portions of Niagara, Genesee, Wyoming, Cattaraugus and Chautauqua Counties.

The population of the Niagara River/Lake Erie Basin totals about 1,227,700 people (2000). The largest population centers are the cities of Buffalo (292,648) and Niagara Falls (55,593), and the surrounding suburban towns of Amherst (116,510), Cheektowaga (94,019) and the town/city of Tonawanda (94,291). Outside these urban and suburban centers, the Basin is largely rural and agricultural.

There are about 5,370 miles of rivers and streams (and canal) and 24 significant¹ lakes, ponds and reservoirs (covering 944 acres) in the basin. The Basin also includes 84 miles of Great Lakes Shoreline (Lake Erie). The length of the main stem of the Niagara River between Lake Erie and Lake Ontario is about 37 miles. The largest tributaries to the Niagara and the New York portion of Lake Erie include Tonawanda Creek with 1,536 miles or 28% of basin stream miles, Cattaraugus Creek (1,429 miles, 27%) and Buffalo River (1,000 miles, 19%). The two largest lakes/reservoirs – Attica Reservoir (174 acres) and Lime Lake (160 acres) represent over one-third (35%) of the total amount of lake acres in the basin.

Water Quality Issues and Problems

The primary water quality issues in the Niagara River/Lake Erie Drainage Basin are associated with the Great Lakes Areas of Concern (AOCs) and associated Remedial Action Plans (RAPs) and Lakewide Management Plans (LaMPs). These multi-jurisdictional water quality restoration and protection efforts originated in the 1980s with the International Joint Commission (IJC) Great Lakes Water Quality Board. Within the Niagara River/Lake Erie Drainage Basin, the focus of these efforts have been on the Niagara River RAP, Buffalo River RAP and the Lake Erie LaMP. These are areas where pollutants seriously impair the beneficial uses of a waterbody and where the United States and Canadian governments have committed to develop and implement plans to restore and protect the uses.

Beyond these Great Lakes Areas of Concern, water quality issues in the Basin are quite diverse. Various non-point source impacts contribute to use impacts throughout the Basin. Not surprisingly, higher incidence of impacts occurs around the more urban areas of the Basin. Point source impacts are generally limited to a few specific waterbody segments. Further review of the more significant water quality issues in the Basin follows.

¹ *Significant Lakes* are lakes of 6.4 acres (0.01 sq. mi.) or larger and are included in the [New York State Lakes Gazetteer](#).

Remedial Action Plans (RAPs)

The Great Lakes Remedial Action Plan (RAP) program originated in 1985 with the International Joint Commission (IJC) Great Lakes Water Quality Board and was formalized in the 1987 amendments to the United States-Canada Great Lakes Water Quality Agreement. The Agreement calls for the federal governments, in cooperation with state and provincial governments, to ensure that RAPs incorporate a systematic and comprehensive ecosystem approach in restoring beneficial uses, and that the public is consulted in all actions undertaken pursuant to RAPs. The ecosystem approach accounts for the interactions among land, air, water, and all living things, including humans.

The RAP documents themselves are pollution identification and abatement action plans that outline the necessary remedial activities to correct use impairments and document progress towards restoration. The RAP process begins with the identification of use impairments, sources, and causes based on 14 IJC indicators. The plans further identify remedial and preventative actions to restore and to protect beneficial uses, and finally seek to document and confirm the restoration and protection of beneficial uses. Remedial Advisory Committees are appointed to enhance public participation and implementation of the RAP process.

There are two RAP Areas of Concern (AOCs) in the Niagara River/Lake Erie Basin. The Niagara River RAP was completed in September 1994. The Buffalo River RAP – developed through a partnership between the NYSDEC and the Buffalo River Citizens' Committee – was completed in 1989. In 2003, the *Friends of the Buffalo Niagara Rivers*, subsequently renamed the *Buffalo Niagara Riverkeeper*, received EPA funding to provide RAP management. Updated status reports for the RAPs are published periodically. Remedial activities in both AOCs have focused on stream water quality, inactive hazardous waste site remediation, contaminated river sediments, point source control, combined sewer overflows, fish and wildlife habitat improvements, and enhanced environmental monitoring activities.

Lake Erie Lake Management Plan (LaMP)

The Great Lakes Water Quality Agreement and its amendments call for the development and implementation of Lakewide Management Plans (LaMPs), including one for Lake Erie. A binational Management Committee, co-chaired by USEPA and Environment Canada, oversees development and implementation of Lake Erie LaMP activities to restore and protect beneficial uses of the lake. Like the RAPs, the Lake Erie LaMP applies the ecosystem approach and involves the public through the Binational Public Forum to address water quality and natural resources management issues. The LaMP focuses on critical pollutants in both the near-shore and open water ecosystems.

Fish Consumption Advisories

Fish consumption along the entirety of Lake Erie is considered impaired due to a NYS DOH health advisory that recommends women of childbearing age and children under the age of 15 eat no more than one meal per month of certain species. Advisories for this population regarding some species (smaller chinook salmon, burbot, freshwater drum, lake whitefish, rock bass and yellow perch) recommend a less restrictive limit of no more than one meal per week - the same as the general (statewide) advisory for fish consumption for all people. Fish consumption in other specific waters in the Basin is also restricted. These waters include the Niagara River, NYS Barge Canal, Buffalo River and Harbor and Cayuga Creek. These advisories are the result of PCBs and dioxin from toxic/contaminated sediments.

Bathing Beach Closures

Public bathing and other recreational uses along portions of the Lake Erie shoreline experience impacts and impairment due to pathogen contamination. Monitoring of beaches along this reach found levels of bacteriological contamination that exceed water quality standards for public bathing uses and result in periodic beach closures. Typically these closures occur during and after wet-weather events. Urban stormwater runoff areas and, in some cases, overflows from wastewater treatment systems are the most commonly cited source of these contaminants. Specific beaches where closures occur frequently include Woodlawn State Park Beach, Lake Erie Beach, Hamburg Bathing Beach, Lake Erie State Park Beach, Wright Park Beach, Main Street Beach, Evans Town Park Beach and Wendt Beach.

Urban/Industrial/CSO Runoff

Various recreational uses, aquatic life use support, and aesthetics in stretches of the urban waterways throughout the Basin are significantly restricted by pollutants from various industrial, municipal, and commercial sources. The most significantly affected of these waterbodies are located in the Buffalo-Niagara Falls area. Urban storm runoff transports a variety of pollutants and debris into the waterways. In addition combined sewer overflows (CSOs) also convey pollutants to the Niagara River, Buffalo River, Lake Erie and smaller tributaries during wet-weather periods. Contaminated sediments, inactive hazardous waste sites and other impacts attributed to past/historic discharges also limit waterbody uses.

Streambank Erosion

General urbanization and development have infringed on the riparian zone of both rivers and lakes in the Niagara River/Lake Erie Basin making streambank erosion a significant concern. The increase in silt/sediment in the waterbodies has resulted in impacts to water supply, aquatic life use support or recreation for more than a quarter of the segments listed on the Priority Waterbodies List.

Agricultural Activity

Considerable agricultural activity in the rural watersheds of the Niagara River/Lake Erie Basin has a significant impact on aquatic life use support and recreational uses of the waters. Agricultural runoff contributes nutrient and silt/sediment loads to the streams. Poor agricultural management practices have significant impacts on the water quality of rivers and lakes in the Basin. Such practices include: allowing livestock unrestricted access to streams, improper manure application on fields, intensively cultivated crop lands with little riparian buffer, fertilizer and pesticide application to fields in the absence of approved nutrient/pesticide management plans, and lack of silage leachate control, manure or milkhouse wastewater treatment facilities. Various state and local agencies are working with the farming community to address these issues.

Failing and/or Inadequate On-site Septic Systems

Aquatic life use support and recreational uses for over 300 river miles and 200 acres of lakes throughout the Basin are impacted by failing and/or inadequate on-site septic systems. Such conditions also raise obvious public health concerns. Efforts to address these problems are hindered by fiscal considerations. Correcting individual systems and/or establishing new sewer service for a larger neighborhood or community results in significant (often insurmountable) financial burden.

Groundwater Resources

Although groundwater resources are not specifically tracked through the Waterbody Inventory/Priority Waterbodies List (WI/PWL), they are considered Priority Waters nonetheless. Groundwater provides drinking water for about one-third of the population of New York State and is the source of base flow for most rivers and streams in the state. Management and protection of both the quantity and quality of this resource is critical to the protection of public health and is also a key element of surface water quality and wetland management efforts.

Groundwater is not incorporated into the WI/PWL because of difficulties with regard to monitoring, assessing and even defining “waterbody segments.” In addition, the emphasis on protection of groundwater now (rather than restoration later) also makes the WI/PWL an inadequate tool to manage this resource. While the WI/PWL discusses water quality threats to some degree, the more typical WI/PWL approach tracks the need for periodic assessment, the determination of impacts and impairments, and the progress toward restoration of uses. While this approach is adequate for surface waters, the considerable difficulty in restoring groundwater resources once degraded, requires a different approach. The proper management of groundwater resources requires a greater emphasis on threats (both known and potential) than the WI/PWL provides, and less focus on restoration. In the Niagara River/Lake Erie Basin, the more significant threats to groundwater resources include hazardous waste sites and land disposal, agricultural sources, inadequately maintained and/or failing on-site septic systems and salt storage and application for road de-icing.

Niagara River/Lake Erie Basin Water Quality Assessment

The series of charts presented on the following pages provides an overall assessment of water quality conditions in the entire Niagara River/Lake Erie Basin. For each waterbody type (rivers/streams and lakes/reservoirs) the pie charts show the portion of the miles/acres of waters in the basin which fall into the various water quality assessment categories. The **dark purple** portion of the first pie indicates waters characterized as *Not Supporting Uses*. The **light purple** portion represents waters with *Minor Impacts/Threats*. Taken together, these two categories of waters comprise the *Priority Waterbodies* for that waterbody type. The portion of waters which fall into the other water quality assessment categories – waterbodies having *No Known Impacts*, *UnAssessed Waters*, and waterbodies with *Impacts Needing Verification* – are shown in **blue**, **light blue**, and **green** respectively.

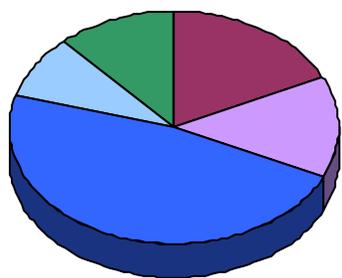
The second pie chart shows the severity of the most significant use impact or restriction for waters on the Priority Waterbodies List (PWL). The levels of severity are:

- Precluded: waters do not support appropriate uses;
- Impaired: waters frequently do not support appropriate uses;
- Stressed: waters support appropriate uses, but other water quality impacts are apparent; and
- Threatened: waters support uses and have no impacts, but activities threaten future use support.

More details regarding these levels of severity are outlined in *Appendix A - Assessment Methodology*.

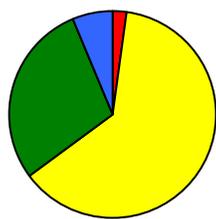
Rivers and Streams Assessment

Water Quality Assessment



- PWL - Not Supporting Uses
- PWL - Supporting/Minor Impacts
- No Known Impacts
- Unassessed Waters
- Impacts Needing Verification

Severity of Impact

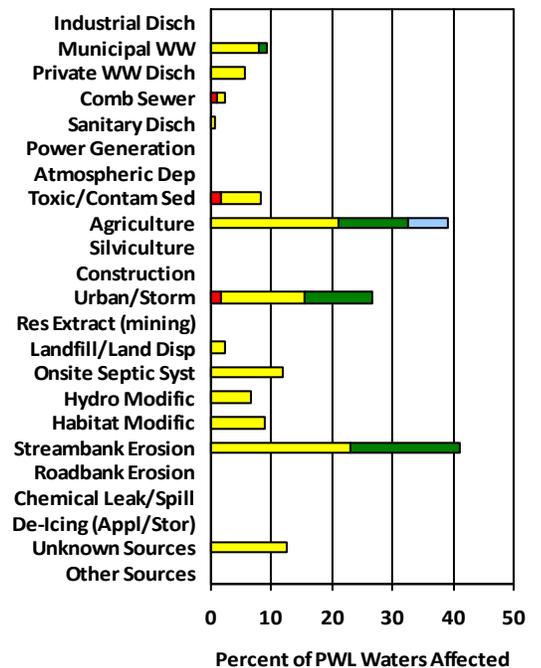


- Precluded
- Impaired
- Stressed
- Threatened

Niagara/Erie Basin

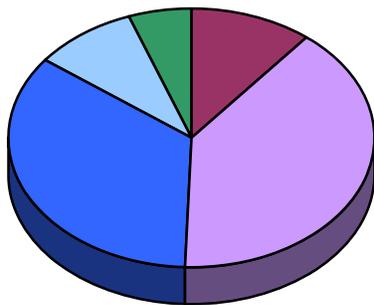
Total Stream Miles: 5,370
Total PWL Miles: 1,713

Major Sources of Impact



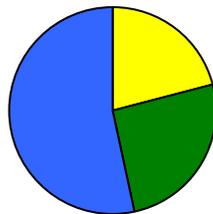
Lakes and Reservoirs Assessment

Water Quality Assessment



- PWL - Not Supporting Uses
- PWL - Supporting/Minor Impacts
- No Known Impacts
- Unassessed Waters
- Impacts Needing Verification

Severity of Impact

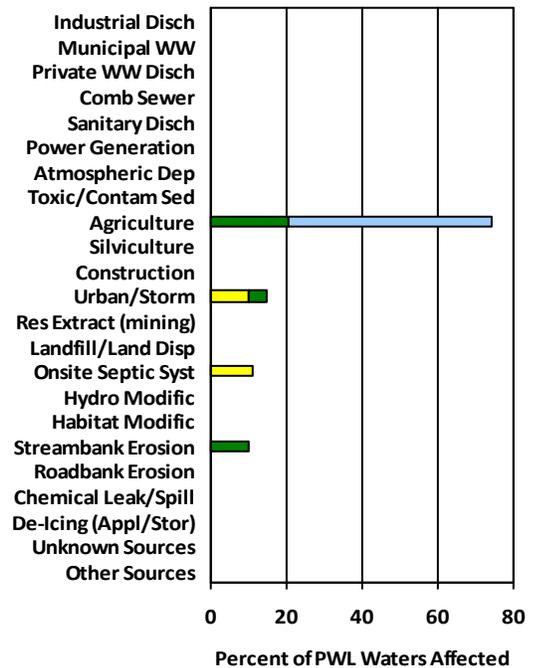


- Precluded
- Impaired
- Stressed
- Threatened

Niagara/Erie Basin

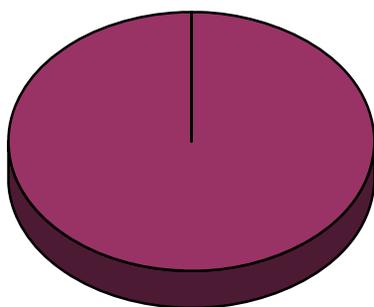
Total Lake Acres: 944
Total PWL Acres: 476

Major Sources of Impact



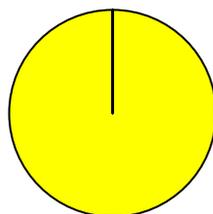
Great Lakes Shoreline Assessment

Water Quality Assessment



- PWL - Not Supporting Uses
- PWL - Supporting/Minor Impacts
- No Known Impacts
- Unassessed Waters
- Impacts Needing Verification

Severity of Impact

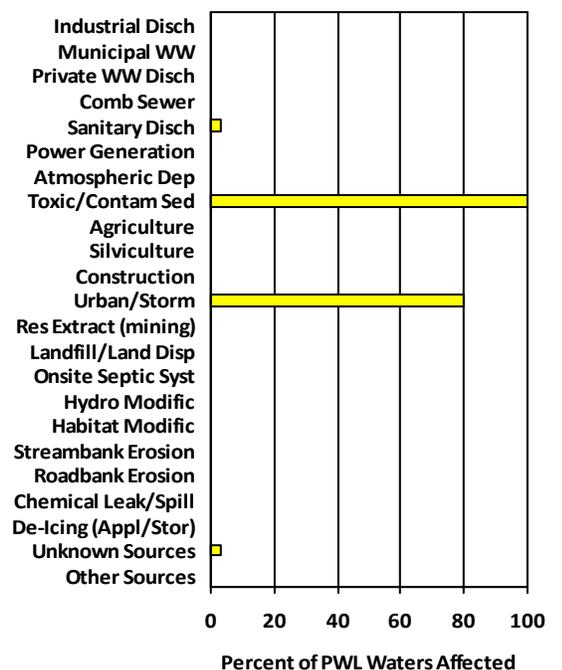


- Precluded
- Impaired
- Stressed
- Threatened

Niagara/Erie Basin

Total Lake Shore Miles: 84
Total PWL Shore Miles: 84

Major Sources of Impact



The bar charts indicate the pollutant sources that are most frequently cited as major contributors to the water quality impacts for Priority Waterbodies in the Niagara River/Lake Erie Basin. The charts reflect the percentage of miles/acres of the total waterbody area included on the Priority Waterbodies List where a particular source is listed as a major contributor to the water quality impact. For each source the color shading of the bar indicates the severity level (Precluded, Impaired, Stressed, Threatened) of the most significant water use impact to the waterbody.

Basin Water Quality Summary

About one-third (32%, or 1,713 miles) of the 5,370 river miles in the Niagara River/Lake Erie Basin are included on the Priority Waterbodies List as either not supporting uses or having minor impacts or threats to water quality. The majority (55%) of these Priority Waterbody Listed river miles are *Impaired* and do not fully support appropriate uses. The remainder (45%) are considered *Stressed* or *Threatened* waters that fully support appropriate uses but have minor impacts/threats to uses. The impaired waters make up nearly 18% of the total river miles in the Basin.

Twelve (12) of the 24 separate lake segments in the basin are included on the PWL as having either impaired uses or minor impacts/threats to uses. These impaired/impacted lakes also represent about one-half (50%) of the total lake acres in the basin. The largest lake identified as having impaired uses is Java Lake, which represents over half (52%) of impaired lake acres in the Basin.

All 84 miles of Great Lakes shoreline in the basin are listed as *Impaired* due to a fish consumption advisory for all of Lake Erie. The advisory is a result of toxic/contaminated sediments. Other uses are also known to be impaired along portions of the Great Lakes shoreline.

The most frequently cited sources of impacts affecting water quality in the Basin are toxic/contaminated sediments, urban/stormwater runoff, agricultural sources and streambank erosion. A number of other identified sources also contribute to impacts and impairments in rivers and streams of the Basin. The wide range of sources reflects impacts from both the urban and the more rural areas in the Basin.

Figure 2
Niagara River/Lake Erie Basin
WI/PWL Water Quality Assessment

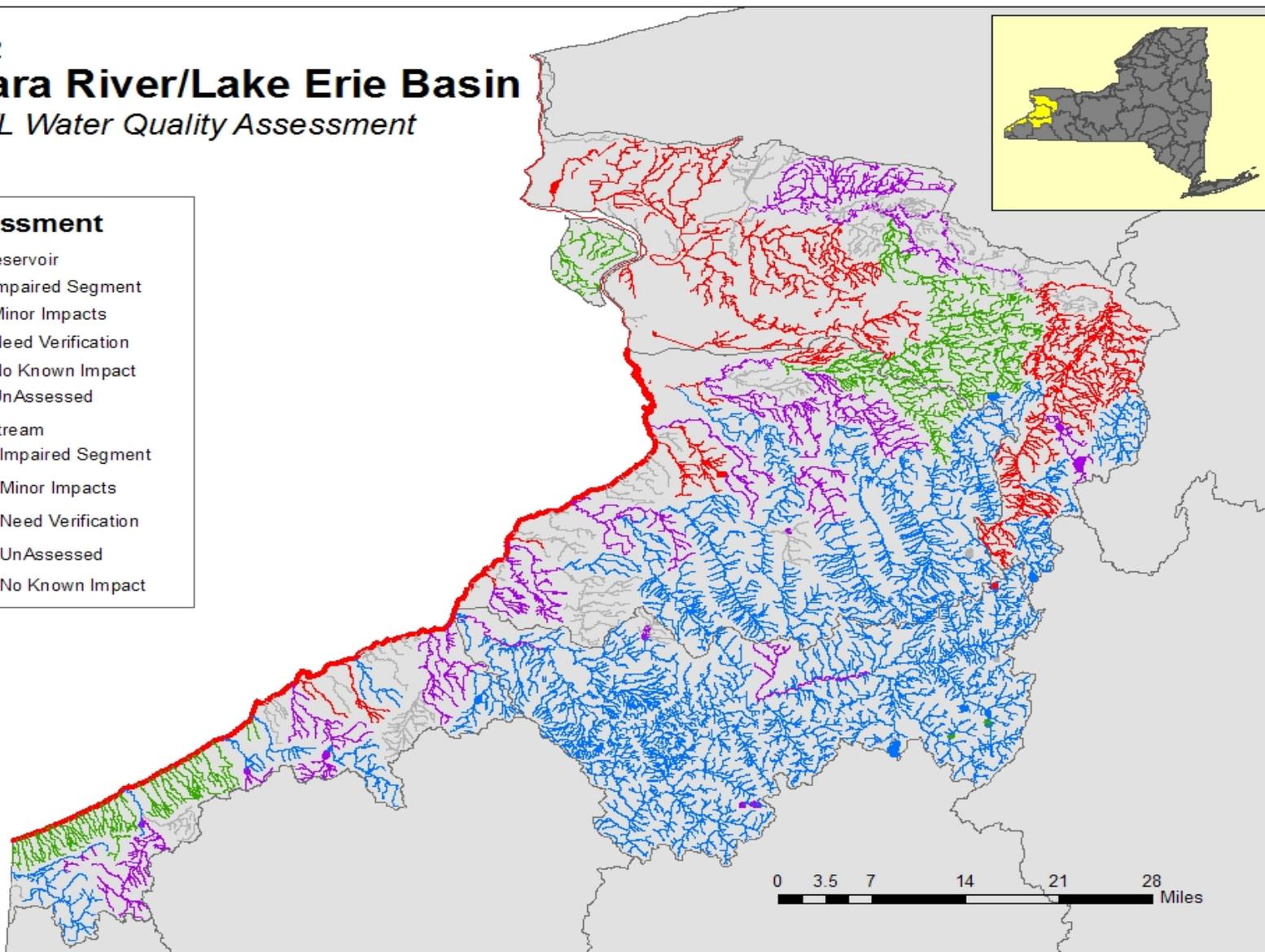
Assessment

Lake/Reservoir

- █ Impaired Segment
- █ Minor Impacts
- █ Need Verification
- █ No Known Impact
- █ UnAssessed

River/Stream

- Impaired Segment
- Minor Impacts
- Need Verification
- UnAssessed
- No Known Impact



The Niagara River/Lake Erie Basin Waterbody Inventory/Priority Waterbodies List

This compilation of water quality information includes individual waterbody *Data Sheets* describing the water quality conditions in the Niagara River/Lake Erie Basin of New York State. Causes (pollutants) and sources of water quality problems for those waterbodies with known or suspected impacts are also outlined.

The data sheets are presented in hydrologic order, beginning with the most downstream waters and continuing upstream through the basin. Waterbody data sheets are grouped by US Geological Survey Hydrologic Unit Code (HUC) and presented as separate sections of this report (see Figure 3). A Waterbody Inventory of the specific waterbody segments in each watershed is included at the beginning of each watershed section.

Data sheets are included for each waterbody that has been assessed; i.e., waterbodies listed as *Impaired Waters* (Not Supporting Uses), Waters with *Minor Impacts*, *Threatened Waters*, waters where water quality impacts *Need Verification*, or waterbodies with *No Known Impact*. *UnAssessed* waterbodies are included in the Waterbody Inventory for each watershed but because they have not been assessed, data sheets for these waters have not been included.

The information outlined on the data sheets includes *Waterbody Location Information*, *Water Quality Problem/Issue Information*, *Resolution/Management Information* and *Further Details*. See *Appendix B – Waterbody Inventory Data Sheet Background Information* for more details about the data sheets.

Note that the assessments in this report reflect the best available water quality information at the time of publication. Water quality information may be added or modified subsequent to the preparation of this edition of the Waterbody Inventory and Priority Waterbodies List. When information is updated, the data sheet for the corresponding waterbody segment is issued with the date of revision. More recently revised data sheets supercede the corresponding waterbody information in this listing.

Following the individual waterbody data sheets in the watershed sections, a *Summary Listing of Priority Waters* provides a brief overview of all *Priority Waterbodies*; i.e., waterbodies listed as *Impaired Waters* (Not Supporting Uses), Waters with *Minor Impacts* and *Threatened Waters*.

Indices of waterbody data sheets by both county and alphabetically by segment name are included as Appendix C and D, respectively.

