

The Lake Ontario (Minor Tribs) Basin

Basin Description

The Lake Ontario (Minor Tribs) Basin is located along Lake Ontario at the northern border of New York State. This drainage basin is comprised of smaller watersheds that lie between the larger rivers that empty into Lake Ontario in New York State (those larger basins are assessed in separate reports). Lake Ontario is the most downstream of the five Great Lakes. As such it drains a watershed of almost 300,000 square miles across much of the North Central United States and South Central Canada. Excluding the drainage area of the other Great Lakes, the Lake Ontario Basin is 24,720 square miles. About 13,500, or 55%, of the basin lies in New York State, with virtually all the remainder in Ontario, Canada. The area drained by the Minor Tributaries of Lake Ontario (excluding the Black, Oswego, Genesee and Niagara Rivers) totals about 2,460 square miles. The drainage area of the minor tribs includes most of Jefferson and Orleans Counties, large portions of Oswego, Wayne, Monroe and Niagara Counties, and smaller parts of Cayuga and Lewis Counties.

The Lake Ontario (Minor Tribs) Basin is diverse in character. Much of the area is rural, with considerable agricultural lands as well as tracts of forest and woodlands. However the basin also includes some significant urban and suburban areas. The majority of the total basin population of 751,891 (2000) is located around the larger urban centers of Rochester (219,773), Watertown (26,705) and Oswego (17,954); although a portion of these city populations lie within the Genesee, Black and Oswego River Basins, respectively. The remaining population centers within the basin are smaller villages that largely support farming or suburban bedroom communities. In the western portion of the basin agriculture includes vineyards and orchards as well as vegetable farming. In the Eastern watershed, dairy farming dominates the Tug Hill Plateau.

There are about 5,891 miles of rivers and streams (and canals) in the basin and over 220 lakes and ponds. Many of the ponds are too small to be individually assessed, but 60 significant* lake, pond and reservoir waterbody segments (covering 18,042 acres) are included in the Lake Ontario (Minor Tribs) Basin Waterbody Inventory. The largest of the minor tributaries to Lake Ontario include the Salmon River with about 639 miles of streams or 11% of the basin total, Oak Orchard Creek (523 miles, 9%), Irondequoit Creek (316 miles, 5%) and Sandy Creek (303 miles, 5%). The next largest are Johnson Creek, Eighteenmile Creek and Salmon Creek, all in the Western Watershed. Of the lakes – which includes enclosed embayments of Lake Ontario – and reservoirs, the largest are Salmon River Reservoir (3,380 acres, or 19% of the basin lake acres), Sodus Bay (3,360 acres, 19%), North Pond (2,400 acres, 13%), Irondequoit Bay (1,720 acres, 10%) and Perch Lake (1,480 acres, 8%). Note that the assessment for Lake Ontario itself is represented by separate waterbody assessments for portions of the Lake Ontario shoreline. These 22 shoreline reaches total about 326 miles in length.

Water Quality Issues and Problems

The primary water quality impacts in the Lake Ontario (Minor Tribs) Drainage Basin are largely associated with water quality in Lake Ontario itself and in the nearshore waters and embayments of the lake. The past/historic discharge of contaminants to Lake Ontario and upstream waters results in a fish consumption advisory that impacts waters across the entire basin. Other water quality issues center around identified Areas of Concern (AOCs) and are being addressed through Remedial Action Plans (RAPs) and the Lake Ontario

* *Significant Lakes* are lakes of 6.4 acres (0.01 square miles) or larger and are included the New York State Lakes Gazetteer.

Lakewide Management Plan (LaMP) – multi-jurisdictional water quality restoration and protection efforts led by the Binational Executive Committee under mandates of the Great Lakes Water Quality Agreement and the Clean Water Act, with oversight by the International Joint Commission (IJC) and its advisory boards.

Beyond Lake Ontario proper, its nearshore waters and the identified Areas of Concern, water quality issues in the remainder of the basin are typical of other parts of New York State and the Northeast. These issues include excessive nutrient loadings from various point and nonpoint sources, atmospheric deposition of pollutants (particularly mercury), the impacts of invasive aquatic plants, zebra mussels and other species, and inadequate on-site wastewater treatment and/or municipal collection systems.

Remedial Action Plans (RAPs)

There are three (3) IJC-identified Areas of Concern (AOCs) in the Lake Ontario (Minor Tribes) Basin: Eighteenmile Creek, Rochester Embayment and Oswego Harbor. The designation as an AOC results in the development of a Remedial Action Plan (RAP) to address water quality issues and restore uses.

The Rochester Embayment Stage II RAP (1997) and 1999 Addendum propose many remedial actions for the watershed that are ongoing or completed. These remedial actions address both urban and rural (i.e., agricultural) sources of impact in this large and very diverse drainage area. Delisting criteria and monitoring methods, to evaluate RAP use impairments in the embayment, have been defined.

Eighteenmile Creek was designated as an AOC in 1985 because of water quality and bottom sediment problems associated with past industrial and municipal discharge practices, the disposal of waste and the use of pesticides. Over the years, numerous contaminants have been identified including but not limited to: PCBs, mercury, dioxins and furans, pesticides and metals. Sediments contaminated with these substances have contributed to the restrictions of fish and wildlife consumption, degradation of benthic organisms, and restrictions on dredging activities in the AOC. The Niagara County Soil and Water Conservation District took responsibility for coordination of the Eighteenmile Creek RAP in 2005.

Remedial Action Plans

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 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.

RAPs 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

In July of 2006 Oswego Harbor was officially removed from the list of Great Lakes AOCs. The harbor is the first and only one of 31 Areas of Concern in the United States to be delisted. Pollution reduction activities in the Oswego Remedial Action Plan (RAP) to date that led to the delisting include remediation of State Superfund hazardous waste sites, upgrade of the Oswego WWTP and collection system, control of point and nonpoint water discharges, reduction of nutrients and stormwater runoff, implementation of river corridor enhancement projects and the Federal Energy Regulatory Commission's (FERC) re-licensing of the Oswego River power dam license to increase and better support the suitable fish habitat in the AOC. These actions have resulted in improved water quality, a more productive fishery, expanded recreational uses and a revitalized river shoreline and downtown area.

Lake Ontario 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 Ontario. A binational Management Committee, co-chaired by USEPA Region 5 and Environment Canada, oversees the development and implementation of Lake Ontario LaMP activities to restore and protect beneficial uses of the lake. Like the RAPs, the LaMPs apply the ecosystem approach and involve the public through periodic meetings to address water quality and natural resources management issues. The LaMP focuses on six critical pollutants (PCBs, mercury, dioxin, mirex, DDT and metabolites and dieldrin) and both the nearshore and open water ecosystems and evaluates use impairments, identifies sources of the identified impairments and recommends strategies for resolution of the impairments and restoration of beneficial uses.

Fish Consumption Advisories - Lake Ontario

Fish consumption in all of Lake Ontario (and all tribs to the first impassable barrier) is impaired due to a NYS DOH health advisory that recommends eating no American eel, channel catfish, carp, larger lake trout (over 25 inches), larger brown trout (over 20 inches) and chinook salmon and eating no more than one meal per month of white sucker, rainbow trout, smaller lake trout, smaller brown trout and larger coho salmon (over 25 inches) because of elevated levels of PCBs, dioxin and mirex. The advisory also recommends eating no more than one meal per month of white perch for portions of the lake east of Point Breeze. The primary source of organics/pesticides is contaminated lake sediments, the result of past/historic industrial discharges to the lake, the Niagara River and the Upper Great Lakes.

Coastal Embayments of Lake Ontario

Although water quality in the open waters of the Lake have greatly improved in recent decades, Lake Ontario shoreline and embayments – bays, river mouths and associated wetland habitat – continue to experience significant impacts that reduce aquatic life support, limit recreational use and ultimately affect the economic development of the region. Attention to these concerns began with a 2000 report “New York’s North Coast: A Troubled Coastline” (Makarewicz, 2000) prepared for the Finger Lakes-Lake Ontario Watershed Protection Alliance. The report was followed up with a 2002 conference hosted by the Center for Environmental Information that brought together over 100 agencies and organizations to discuss concerns about algae blooms and aquatic weeds, invasive species, habitat destruction, turbidity and sediment loadings, water level fluctuations and resulting impacts to coastal waters and shoreline resources, and other issues. These early efforts grew into the Lake Ontario Coastal Initiative, which enlists and coordinates broad public commitment from North Coast stakeholders to further the remediation, restoration, protection, conservation and sustainability of the resources of this coastal region.

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 larger urban areas that straddle the major rivers separating the sub-basins of the Lake Ontario Basin: Watertown, Oswego, and Rochester. Urban and storm runoff transport pollutants and debris into the waterways of the basin. In addition, combined sewer overflows (CSOs) serving a few municipalities also convey pollutants to waterways during wet-weather periods. Contaminated sediments, inactive hazardous waste sites and other impacts attributed to past/historic industrial activities and discharges also limit waterbody uses.

Fish Consumption Advisory - Atmospheric Deposition of Mercury

Fish consumption in Salmon River Reservoir is impaired due to a NYS DOH health advisory that recommends eating no more than one meal per month of largemouth and smallmouth bass because of elevated mercury levels. The source of mercury is considered to be atmospheric deposition, as there are not other apparent sources in the lake watershed. The advisory for this lake was first issued in 2005-06. Although this advisory applies to a single waterbody, the Salmon River Reservoir is the largest lake in the basin (excluding Lake Ontario itself) and accounts for 19% of the lake acres in the basin.

Inadequate On-site Wastewater Treatment and/or Municipal Collection Systems

Failing/inadequate on-site septic systems and other untreated sanitary discharges to waters account for a measurable percentage of the water quality impacts identified in this assessment. In addition to the impact on recreational use and aquatic life support, such conditions also raise public health concerns as well. Efforts to address these problems are often hindered by fiscal considerations, as correcting individual systems and/or establishing new or repairing existing municipal service in a community can result in a significant financial burden.

Groundwater Resources

Although groundwater resources are not specifically tracked through the 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 for protecting public health, and is also a key element of surface water quality and wetland management efforts. In the Lake Ontario River Basin, the more significant threats to groundwater resources include inactive hazardous waste sites, pesticide application, animal feeding operations, deep-well injection, on-site wastewater treatment systems and chemical spills.

Lake Ontario (Minor Tribes) Basin Water Quality Assessment

The series of charts presented on the following pages provides an overall assessment of water quality conditions in the entire Lake Ontario (Minor Tribes) Basin. For each waterbody type (rivers/streams and lakes/reservoirs) the first chart shows the percentage of the miles/acres of waters in the basin that fall into the various *Water Quality Assessment Categories*. The red portion of the first pie indicates the percentage of waters characterized as *Impaired Segments* which do not support appropriate uses. The purple portion represents segments with *Minor Impacts* and *Threatened Waterbody Segments*. Taken together, waters in both of these categories (represented by the red and purple segments) comprise the **Priority Waterbodies** (for that waterbody type) within the basin. The percentage of miles/acres for the other Water Quality Assessment Categories – *Waterbodies Having No Known Impacts*, *UnAssessed Waterbodies*, 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 *Priority Waterbodies*. The levels of severity are:

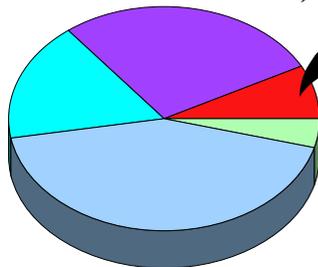
- Precluded:* waters do not support appropriate uses,
- Impaired:* waters frequently do not support appropriate uses,
- Stressed:* waters support appropriate uses, but other water quality impacts are apparent, and
- Threatened:* waters support uses and have no impacts, but activities threaten future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

More detailed descriptions of these levels of severity are outlined in [Appendix A - Assessment Methodology](#).

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 Lake Ontario (Minor Tribes) Basin. The charts reflect the percentage of miles/acres of the total waterbody area on the Priority Waterbodies List where the source is listed as a major contributor to the water quality impact. For each source, the color shading of the bar indicates the severity (*Precluded, Impaired, Stressed, Threatened*) of the most significant water use impact to the waterbody.

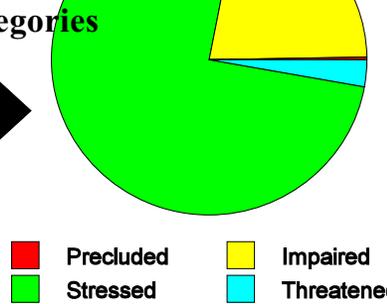
Rivers/Streams

Water Quality Assessment Categories
(for ALL Waters in the Basin)



- PWL - Not Supporting Uses
- PWL - Other Minor Impacts
- No Known Impacts
- UnAssessed Waters
- Impacts Needing Verification

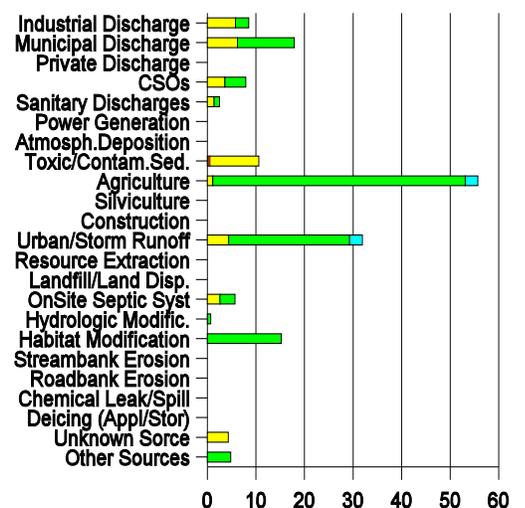
Severity of Problems
(PWL Segments Only)



Lake Ontario Basin

Total River Miles: 5,892
Total PWL Miles: 2,100

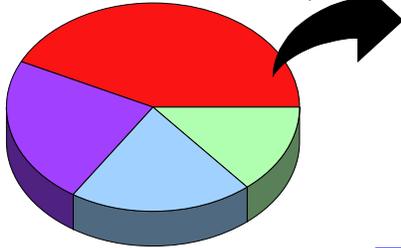
Major Sources of Impact
(PWL Segments Only)



Percent of PWL Waters Affected

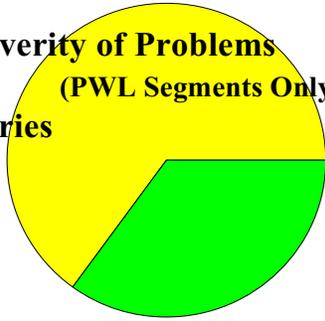
Lakes/Reservoirs

Water Quality Assessment Categories (for ALL Waters in the Basin)



- PWL - Not Supporting Uses
- PWL - Other Minor Impacts
- No Known Impacts
- UnAssessed Waters
- Impacts Needing Verification

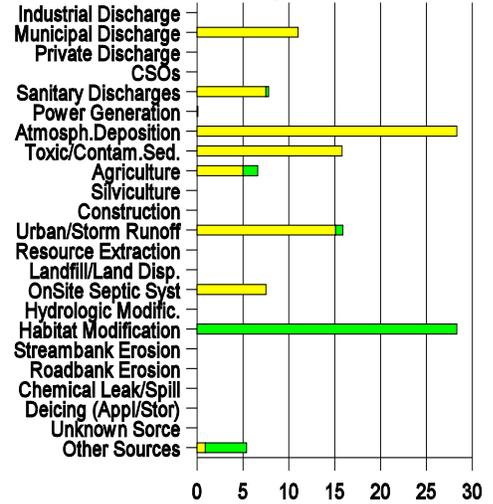
Severity of Problems (PWL Segments Only)



- Precluded
- Impaired
- Stressed
- Threatened

Lake Ontario Basin
 Total Lake Acres: 18,042
 Total PWL Acres: 11,924

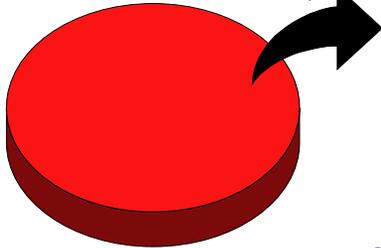
Major Sources of Impact (PWL Segments Only)



Percent of PWL Waters Affected

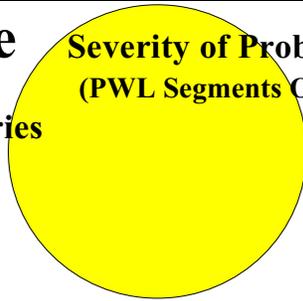
Great Lake Shoreline

Water Quality Assessment Categories (for ALL Waters in the Basin)



- PWL - Not Supporting Uses
- PWL - Other Minor Impacts
- No Known Impacts
- UnAssessed Waters
- Impacts Needing Verification

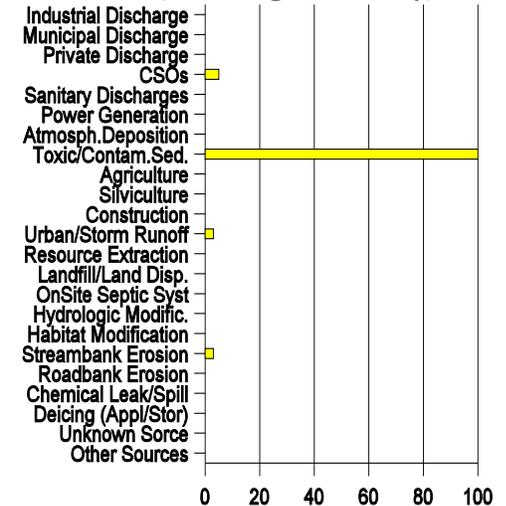
Severity of Problems (PWL Segments Only)



- Precluded
- Impaired
- Stressed
- Threatened

Lake Ontario Basin
 Total Shoreline Miles: 326
 Total PWL Miles: 326

Major Sources of Impact (PWL Segments Only)



Percent of PWL Waters Affected

Basin Water Quality Summary

About one-third (36% or 2,100 miles) of the river miles in the Lake Ontario (Minor Tribs) Basin are included on the Priority Waterbodies List as either not supporting uses or having minor impacts or threats to water quality. The large majority (78%) of these river miles are considered *Stressed* or *Threatened* waters that fully support appropriate uses, but that have minor impacts/threats to uses. Only about eight percent (8%) of basin river miles are *Impaired* and do not fully support appropriate uses.

Eighteen of the 60 separate lake segments in the basin are also included on the PWL as having impaired uses or minor impacts/threats to uses. However these 18 impaired/impacted lakes represent two-thirds (66%) of the

total lake acres in the basin. For ten of these lakes (totaling 7,759 acres, or 43% of the basin) the impacts are such that fish consumption, recreational uses and/or aquatic life support are not fully supported. These include Salmon River Reservoir and Irondequoit Bay (the first and fourth largest lakes in the basin) which are impaired due to fish consumption advisories.

All of the 326 miles of Great Lake Shoreline in the basin is assessed as being impaired and not supporting uses due to the fish consumption advisory for Lake Ontario. This advisory is the result of organics/pesticides contamination of lake sediments related to past/historic industrial discharges to the lake, the Niagara River and the Upper Great Lakes.

In addition to contaminated sediments, other significant sources of the more severe impacts and impairments to the waters of the basin include urban runoff, municipal/industrial discharges and combined sewer overflows. Atmospheric deposition of mercury results in a fish consumption advisory for just one waterbody, but it is the 3,380 acre Salmon River Reservoir which accounts for 19% of lake acres in the basin. Agricultural nonpoint sources that increase nutrient and silt/sediment loadings and habitat modifications (invasive species and excessive weed growth) are also frequently cited sources of minor impacts to uses.

Figure 1 - Lake Ontario (Minor Tribs) Basin Water Quality Assessment Map

The 2004 Lake Ontario (Minor Tribes) Basin Waterbody Inventory/Priority Waterbodies List

This inventory of water quality information includes individual waterbody *Data Sheets* describing the water quality conditions in the Lake Ontario (Minor Tribes) 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 on the following pages are compiled in hydrological order and grouped by US Geological Survey Hydrologic Unit Code (HUC) basin and smaller watersheds in the Lake Ontario (Minor Tribes) Basin (see Figure 2). An outline of the specific waterbodies in each watershed is presented at the beginning of each Watershed Section. Data sheets are included for each waterbody that has been assessed; that is, waterbodies listed as *Impaired Segments*, *Segments with Minor Impacts*, *Threatened Waters*, waters with water quality impacts *Needing Verification*, or waterbodies with *No Known Impact*. *UnAssessed* waterbodies are listed in the hydrologic outline of waterbodies at the front of each Watershed Section; however, separate data sheets for these segments are not included.

The information outlined on the data sheets includes *Waterbody Location Information*, *Water Quality Problem/Issue Information*, *Resolution/Management Information* and *Further Details*. More explicit explanations of these data fields are outlined in Appendix B - Waterbody Inventory Data Sheet Background Information.

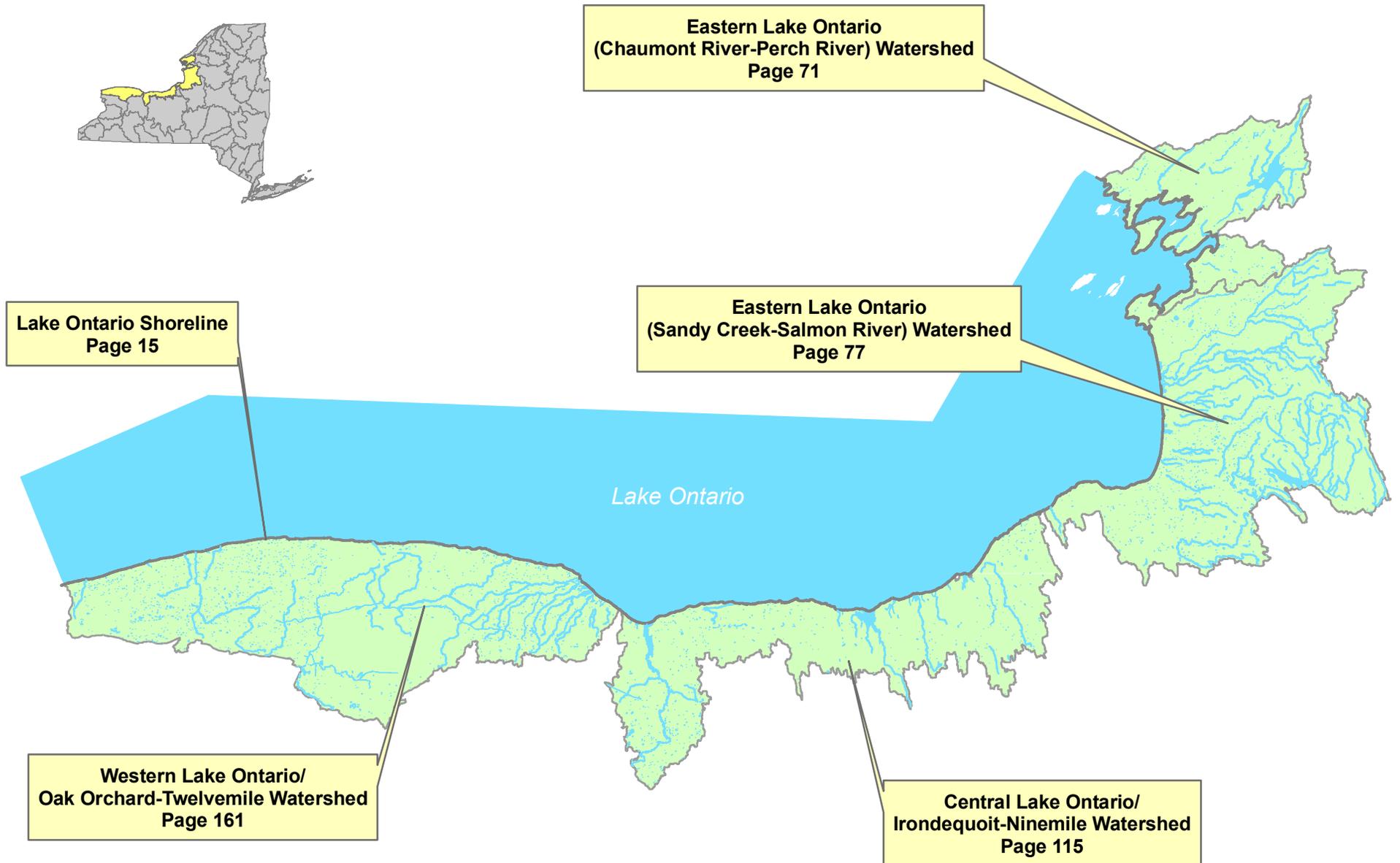
Note also that the inventory reflects the best available water quality information at the time of publication. Water quality information may be added or modified subsequent to the preparation of this edition of the Waterbody Inventory and Priority Waterbodies List. When water quality information is updated, the corresponding waterbody segment data sheet is issued with an appropriate revision date. The information on more recently revised data sheets supercedes the information in this listing.

In addition to the more detailed data sheets, a *Summary Listing of Priority Waters* provides a brief overview of all *Priority Waterbodies* (i.e., *Impaired Segments*, *Segments with Minor Impacts* and/or *Threatened Waters*). This listing follows the Data Sheet Section of the report.

Cross-referenced lists of the waterbody data sheets are included at the end of the report as Appendix C - County Index of Data Sheet Segments and Appendix D - Alphabetic Index of Data Sheet Segments.

Figure 3

Lake Ontario (Minor Tribs) Drainage Basin Watersheds



0 10 20 40 60 80 Miles