

The Atlantic Ocean/Long Island Sound Basin

Basin Description

The Atlantic Ocean/Long Island Sound Basin drains the New York City Metropolitan area and all of Long Island in the southeast corner of New York State. The drainage area encompasses all marine waters in New York Harbor, Long Island Sound, Block Island Sound, along the South Shore of Long Island, and the waters that drain into these waterways. The basin includes about 1,650 square miles of land area within New York State. Significant interstate marine waters such as Long Island Sound (Connecticut) and New York Bay and The Kills (New Jersey) are included in the basin. Within New York State the basin drainage area includes all of Kings (Brooklyn), Nassau, New York (Manhattan), Queens, Richmond (Staten Island) and Suffolk Counties, and most of Bronx County and a portion of southern Westchester County. Note that the Lower Hudson River north of the Battery is included in the Lower Hudson River Basin WI/PWL Report.

The population of the New York State portion of the Atlantic Ocean/Long Island Sound Basin totals 8,893,935 people (2000). Including the area beyond the New York State border, approximately 16 million people reside within the New York metropolitan area. It is the most densely populated region in the United States, and one of the most densely populated places in the world. The western portion of the basin is highly urbanized. Land use gradually shifts to suburban as one moves to the east. Eastern Long Island is more rural with some agricultural activity.

The surface water resources of the Atlantic Ocean/Long Island Sound Basin are dominated by the estuary/marine waters which cover 888,212 acres (or 1,388 square miles). There are also about 488 miles of freshwater rivers and streams and 131 significant¹ freshwater lakes, ponds and reservoirs (covering 7,175 acres) in the basin. The Atlantic Ocean coastline stretches for 118 miles from Rockaway Point at New York Bay to Montauk Point in Eastern Suffolk County.

Water Quality Issues and Problems

Not surprisingly – given the basin’s population density, urban setting, early settlement and resulting aging infrastructure – the waters of the basin experience considerable stress. However, in spite of numerous water quality issues, the waters of the basin also remain a rich and valuable (economic and ecological) resource. The basin supports bathing, boating and other recreational activities, commercial fishing and shellfishing, and world class port operations. These coastal waters also support unique and potentially threatened habitats.

Numerous sources contribute to water quality problems in the basin. These include municipal and industrial discharges, urban storm runoff, combined and separate sewer overflows, contaminated sediments, oil and hazardous material spills, nonpoint source runoff from a variety of activities, landfill leachate, dredge spoil disposal, ground/surface/saltwater intrusion, and thermal discharges.

¹ * *Significant Lakes* are lakes of 6.4 acres (0.01 square miles) or larger and are included in the New York State Lakes Gazetteer.

Low Dissolved Oxygen in Long Island Sound

Seasonal low dissolved oxygen (DO) in Long Island Sound has been the focus of considerable study. Hypoxia in the bottom waters of the western Long Island Sound have caused fish and crustacean kills and induce finfish to avoid the area. The Long Island Sound Study (LISS) has determined the dissolved oxygen problem is primarily due to algal die-off. Excessive algal blooms in the Sound have been attributed to nitrogen loads from wastewater treatment plant discharges, combined sewer overflows (CSOs) and stormwater and urban runoff. The most significant pollutant loadings to western Long Island Sound are the New York City treatment plants on the Upper East River. Other significant pollution sources to the Sound include other municipal discharges to the basin, stormwater runoff, combined sewage overflows, and atmospheric deposition. In 1998 New York State and Connecticut agreed to nitrogen reduction targets of nearly 60% and a commitment to enforce the targets through the development of a Total Maximum Daily Load (TMDL) plan. The TMDL was completed in December 2000. In addition to point and nonpoint source controls, the TMDL includes further actions to address the control of nitrogen (and carbon) from outside the immediate LISS area.

Combined Sewer Overflows (CSOs)

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. The Order follows the two-phased approach identified in the USEPA CSO Control Policy which calls for Nine Minimum Control Measures to minimize overflows and CSO pollution and the development of Long Term Control Plans to address water quality issues not fully addressed by the nine minimum controls. As a result NYCDEP is undertaking projects totaling of \$2 billion to capture about 75% of wet-weather overflows. The Order also requires NYCDEP to develop 11 Waterbody/Watershed Facility Plans (WWFPs) to identify remaining water quality issues, evaluate CSOs contributions to these problems and form the basis of subsequent Long Term Control Plans (LTCPs) to bring these waters into compliance with water quality standards. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary.

Municipal Wastewater Treatment

Given the population density of this highly urbanized basin, it is not surprising that the management of municipal wastewater to minimize its impact on water quality is a significant issue. A number of major construction projects are currently underway to upgrade treatment and increase the capacity of the 14 large New York City wastewater treatment plants to meet required nitrogen reductions, increase capture of wet-weather flows, and address aging infrastructure issues. Similar stresses, along with increasing population and development pressures, are driving wastewater treatment needs in Westchester and Nassau Counties.

Urban/Stormwater Runoff

Urban/stormwater runoff from impervious surfaces in this highly urbanized watershed transport significant amounts of various pollutants to the waters of the basin. These pollutants include nutrients, silt/sediment, pathogens, floatables, oil/grease, metals and other substances. New York City has undertaken a major Green Infrastructure initiative to help address these concerns. In addition, the ongoing effort to address wet-weather inflow to reduce CSO discharges is continuing. The impact of CSOs has been reduced by diverting more flow to the treatment plants during storm events, booming and skimming efforts at CSOs,

and by implementation of the NYCDEP Catch Basin Hooding Program to control floatables. Other efforts include facility and conveyance system upgrades and expanding holding capacity for subsequent treatment.

Shellfishing Restrictions

Bacteriological contamination from urban runoff, CSOs, storm sewers and other discharges results in prohibitions against shellfishing in some of the marine waters around New York City and Long Island. Shellfish that grow in contaminated waters can accumulate disease-causing microorganisms (bacteria, viruses) that can be eaten with the shellfish. The NYSDEC Bureau of Marine Resources conducts a USDA-approved Shellfish Land Certification Program, the objective of which is to safeguard public health by determining those waters that are safe for shellfishing, and closing areas deemed unsafe. Certification is based on results of bacteriological sampling and evaluation of potential pollution sources along the shore, and evaluation of data against New York State and National Shellfish Sanitation Program monitoring criteria for pathogens. Certified/uncertified shellfish area designations are revised regularly. For detailed descriptions of current designations, go to www.dec.ny.gov/regs/4014.html.

Fish Consumption Advisories

Various fish consumption advisories are in place for the waters of the Atlantic Ocean/Long Island Sound Basin. These restrictions are primarily a result of PCB contamination. The more significant waterbody-specific advisories apply to New York Harbor, East River, Harlem River, The Kills and the western half of Long Island Sound. Less severe recommendations regarding the consumption of bluefish, American eel and striped bass affect most other marine waters in the basin. However it is worth noting that these advisories are due primarily to the presence of migratory species and not necessarily the result of contaminants within the marine waters themselves. The general statewide advisory (eat no more than one meal per week) applies to bluefish and American eel, but not most other marine water species. A number of freshwater ponds and streams in this drainage basin have fish consumption advisories, primarily due to PCB and/or pesticide contamination, in particular, chlordane. This is presumably due to the extensive use of chlordane as an insecticide. An advisory in Lake Capri in Suffolk County is in response to elevated cadmium levels.

Public Bathing

Numerous public beaches and marinas in New York City and Nassau, Suffolk and Westchester Counties attract bathers and boaters from throughout the area and beyond. While basin waters generally support these recreational uses throughout the basin, public health warnings and occasional beach closures resulting from raw sewage bypasses, combined sewer, separate sewer and stormwater overflows, municipal discharges and urban runoff do occur. Occasional beach closures that occur are typically pre-emptive closures during heavier rainstorms that are known to wash pollutants into the harbor. New York City, Nassau, Suffolk and Westchester Counties, New Jersey and Connecticut all conduct beach water quality monitoring programs. The region has also developed a sophisticated water quality model and communication network to monitor and assess impacts and notify resource managers.

Estuary Programs

A number of major estuary management and study efforts are underway to evaluate water quality issues and remediation actions within the basin. Among these, are three designated National Estuary Programs: the Long Island Sound Study, the New York-New Jersey Harbor Estuary Program and the Peconic Estuary Program. A fourth program – the South Shore Estuary Reserve – is a state-led effort managed through the

New York State Department of State. These programs have developed and are implementing watershed-based comprehensive management plans to address water quality issues, restore and protect habitat and aquatic resources, reduce contamination and support education, outreach and stewardship. To accomplish these goals, all rely on partnerships between local, state, and federal governments, citizen and environmental groups, businesses and industries, and academic institutions.

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 – including most Long Island residents outside of New York City – 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.

Groundwater is not incorporated into the WI/PWL because of the 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 use of groundwater for drinking water supplies, the corresponding impact on public health, and 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 Atlantic Ocean/Long Island Sound Basin, the more significant of these threats include hazardous waste landfills and industrial contamination, inadequate and/or failing on-site septic systems, over-development resulting in increased impervious area and lack of recharge, salt water intrusion, salt storage and application for road deicing.

Atlantic Ocean/Long Island Sound Basin Water Quality Assessment

The series of charts presented on the following pages provides an overall assessment of water quality conditions in the entire Atlantic Ocean/Long Island Sound 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.

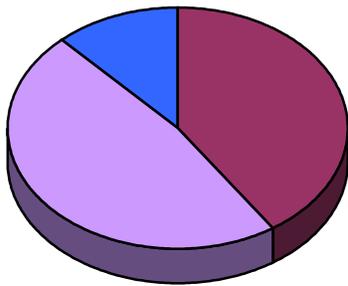
The second pie chart shows the severity of the most significant use impact or restriction for waters on the Priority Waterbodies List (PWL). The levels of severity are:

- 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 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 Atlantic Ocean/Long Island Sound Basin. The charts

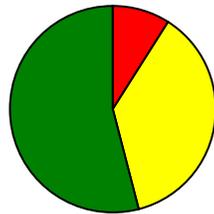
Estuary Waters Assessment

Water Quality Assessment



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

Severity of Impact

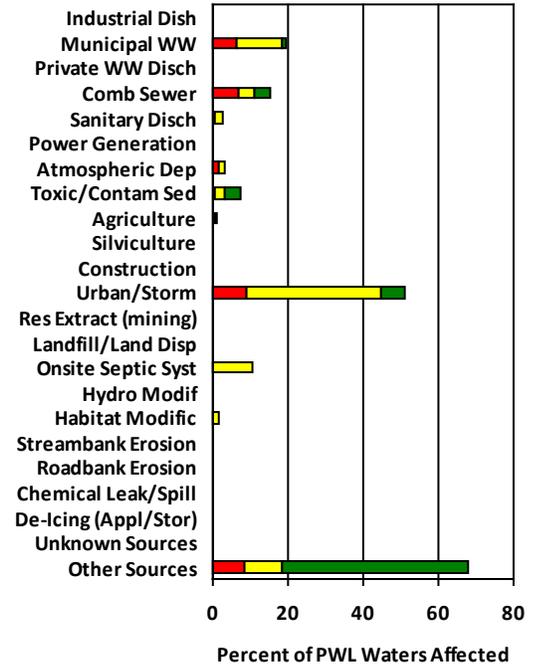


- Precluded
- Stressed
- Impaired
- Threatened

Atlantic/LIS Basin

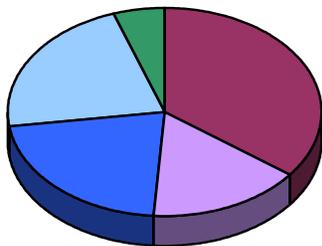
Total Estuary Acres: 888,212
Total PWL Acres: 783,086

Major Sources of Impact



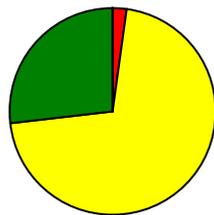
Rivers and Streams Assessment

Water Quality Assessment



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

Severity of Impact

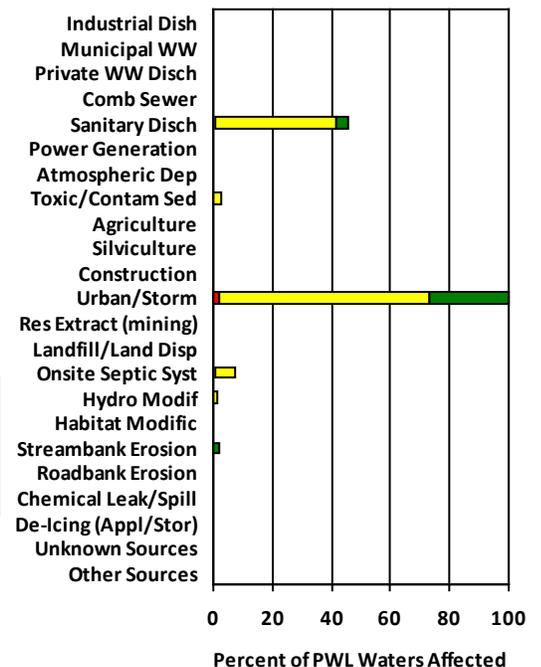


- Precluded
- Stressed
- Impaired
- Threatened

Atlantic/LIS Basin

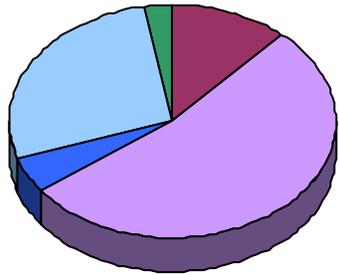
Total Stream Miles: 488
Total PWL Miles: 248

Major Sources of Impact



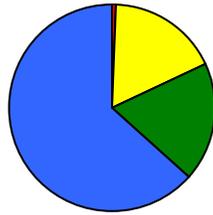
Lakes and Reservoirs Assessment

Water Quality Assessment



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

Severity of Impact

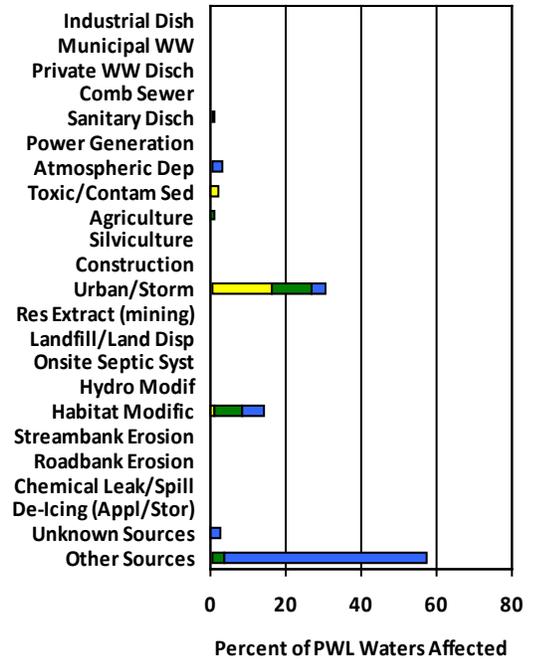


- Precluded
- Impaired
- Stressed
- Threatened

Atlantic/LIS Basin

Total Lake Acres: 7,175
Total PWL Acres: 4,636

Major Sources of Impact



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

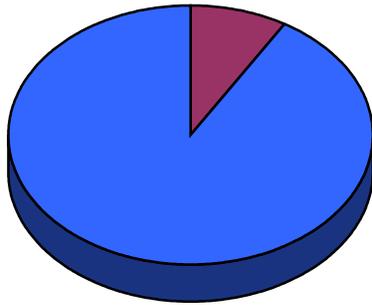
A large percentage (83%, or 738,086 acres) of the 888,212 acres of estuary waters in the basin is included on the Priority Waterbodies List as either not supporting uses or having minor impacts to water quality. About 54% of these PWL waters are considered *Stressed* or *Threatened* waters that fully support appropriate uses but have minor impacts/threats to uses. About 41% of estuary waters in the basin are *Impaired* and do not fully support appropriate uses. Widespread fish consumption advisories – some that are the result of contaminated migratory species, and not necessarily due to contaminants within the waters themselves – contribute to 98% of all impaired/impacted estuary waters.

About half (51%, or 248 miles) of the 488 miles of freshwater rivers and streams in the basin are included on the PWL as having either minor impacts or impaired uses. The majority (69%) of these PWL miles are impaired and do not support uses. These impaired river miles make up about one-third (35%) of the total river miles in the basin, with another 16% listed as having minor impacts.

Fifty-nine (59) of the 131 separate lake/reservoir segments in the basin are included on the PWL as having either impaired uses or minor impacts/threats to uses. These impaired/impacted waterbodies also represents almost two-thirds (65%) of the total lake acres in the basin. These percentages are driven in large part by the assessment of the largest of the lake/reservoir waterbodies (Kensico Reservoir) as *Threatened*. This

Ocean Coastline Assessment

Water Quality Assessment



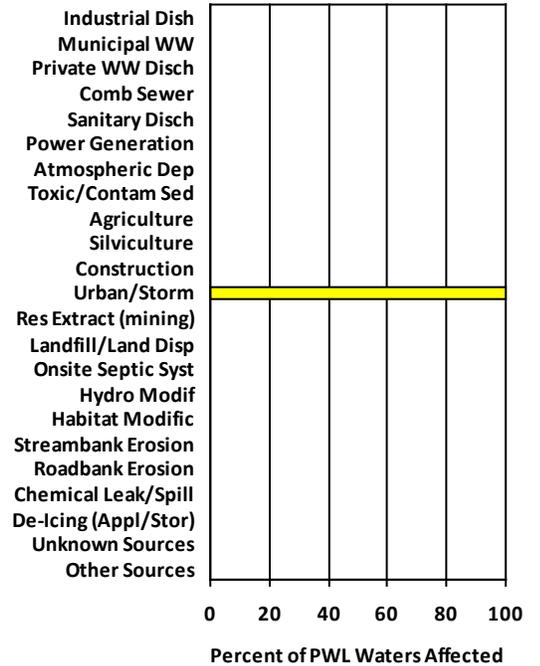
- PWL - Not Supporting Uses
- PWL - Supporting/Minor Impacts
- No Known Impacts
- Unassessed Waters
- Impacts Needing Verification

Severity of Impact

- Precluded
- Impaired
- Stressed
- Threatened

Atlantic/LIS Basin	
Total Coastal Miles:	118
Total PWL Miles:	10

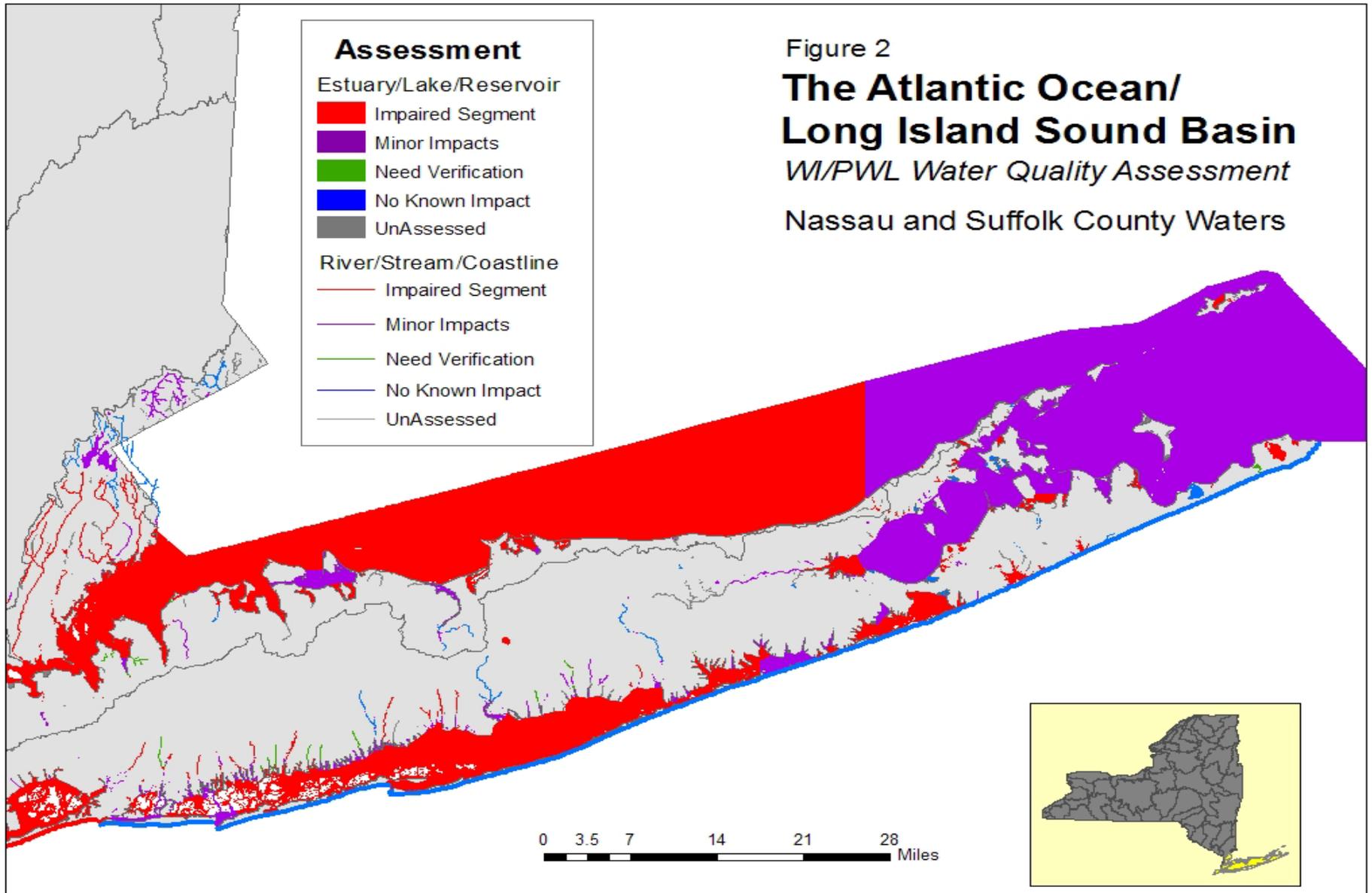
Major Sources of Impact



one reservoir accounts for more than one-third of the lake/reservoir acres in the basin and over half (54%) of the acres on the PWL. About 12% of total lake/reservoir waters in the basin do not fully support uses.

Over ninety percent (92%) of ocean coastline in the basin is assessed as having no known impacts and fully supports uses.

The most frequently cited source of impairment and impacts affecting water quality in this highly developed basin is urban stormwater runoff, which accounts for over 50% of estuary impairment/impacts, 100% of river and coastline, and over 30% of lake/reservoir impairment/impacts. Other significant contributors to water quality problems include combined sewer overflows (CSOs), municipal discharges and other sanitary discharges. Among the “other sources” category reflected in the assessment are contaminated migratory species, boat pollution and waterfowl.



The Atlantic Ocean/Long Island Sound Basin Waterbody Inventory/Priority Waterbodies List

This compilation of water quality information includes individual waterbody *Data Sheets* describing the water quality conditions in the Atlantic Ocean/Long Island Sound 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) basin 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 with 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.

Figure 3

The Atlantic Ocean/ Long Island Sound Basin

New York City Metropolitan Waters

Watershed Map



North Shore Long Island Watershed
Page 15

Peconic Estuary Watershed
Page 143

South Shore Long Island Watershed
Page 301

