**Part I**

# *Executive Summary*

The 54,471 square miles of New York State are rich in water resources. Freshwater resources include more than 87,000 miles of rivers and streams, nearly 7,900 lakes and ponds totaling about 690,000 acres (not including Great Lakes), and over 400 miles of Great Lakes coastline. The marine waters of the state include more than 1,530 square miles of estuaries, as well as about 120 linear miles of Atlantic Ocean coastline. New York State is the only state in the country that has some of all five designated waterbody types. Additionally, about six million residents draw drinking water from abundant groundwater resources in the state. Water quality in a majority of these waters supports all intended uses. However, there are waterbodies that are affected by some level of water quality impact, use impairment, or are otherwise threatened by various human activities.

The New York State Department of Environmental Conservation (NYSDEC) Division of Water maintains an extensive inventory/database of these waters. The *Waterbody Inventory/Priority Waterbodies List* (WI/PWL) provides summaries of general water quality conditions, tracks the degree to which the waterbodies support (or do not support) a range of uses, and monitors progress toward the identification and resolution of water quality problems, pollutants and sources. Information from the WI/PWL was used to compile this *Clean Water Act Section 305(b) Water Quality Report.*

An overview of current water quality conditions in New York State–drawn from the WI/PWL– is represented in Figure 1 on page 3. For each of five categories of waterbodies, the figure shows the percentage of waters in New York State that are listed as Priority Waterbodies (waters with documented water quality impacts, use impairments or threats), waters needing verification of a suspected water quality impact/use impairment, and waters with no known impact/use impairment or that are unassessed. In addition, for Priority Waterbodies the severity of water quality problems (*precluded, impaired, stressed* or *threatened*) is also indicated. More complete descriptions of these severity levels are outlined in the *Assessment Methodology*.

New York State has devoted considerable resources to water quality assessment over the past two years. As a result, much progress has been made since the 2006 report. Basin-wide assessments have been completed for six drainage basins. These updated assessments for the Allegheny River, Black River, Chemung River, Lake Ontario tributaries, Oswego River (Finger Lakes), Upper Hudson River drainage basins are reflected in this report. In addition, NYSDEC has finished the georeferencing of all discrete assessment units (AUs) to the National Hydrologic Dataset (NHD, 1:24,000). The completion of this GIS layer has enabled New York State to better manage water quality data, create a statewide picture of overall water quality, as well as substantially ease the dissemination of water quality assessment information both internally and externally.

Using the newly created GIS layer, segment sizes for each AU were re-evaluated within ArcGIS. Subsequently, the reported value of total waters in the state changed substantially. For this report, as well as future submissions, New York State will be utilizing these newly calculated values to determine the extent of water quality assessment in the state. Undeniably, the accepted sizes of single assessment units may have changed considerably from the 2006 (and prior) reports. These segment size adjustments will account for some of the variation in % relationships reported since the 2006 *Section 305(b) Water Quality Report.* It is imperative that one approach the comparison of values with the knowledge that the sizes of many assessment units have been adjusted.

EPA requirements for integrated (Section 305(b)/303(d)) reporting attempt to address the fact that many of the nation's waters remain unmonitored and unassessed. EPA promotes a probabilistic monitoring design applied over large areas, as one approach to producing with relatively known confidence, a "snapshot" or statistical representation of the extent of waters that may or may not be impaired.

New York State supports the EPA goal of 100% assessment of all waters. However, while the probabilistic monitoring approach adequately answers basic 305(b) questions, its lack of waterbody-specific water quality information inadequately supports water protection and restoration efforts, including TMDL development. In lieu of probabilistic monitoring, New York State utilizes a rotating drainage basin approach in water quality monitoring and assessment, the objectives of which are outlined below:

- a complete and thorough evaluation of all available monitoring data;
- a comprehensive assessment of water quality throughout the state, and
- a coordinated approach to the restoration, protection and management of water resources.

The lake, river/stream, and groundwater programs operate on a rotating basin schedule (Figure 3; Table 6). Each year, monitoring is initiated in 2-3 of the state's 17 major drainage basins, resulting in one cycle of monitoring and assessment in each of the major basins of the state over a period of 5 years. Monitoring is conducted over a two year period and activities differ in each of the two years, in order to meet the different program objectives identified above.

In the third year, monitoring data are used to update the Waterbody Inventory/Priority Waterbodies List. The WI/PWL is a statewide inventory of New York State waterbodies which characterizes water quality, the degree to which water uses are supported, progress toward the identification of water quality problems and sources, and activities to restore and protect each individual waterbody. Data from these reports are used to formulate the Section 303(d) List of Impaired Waters and the Section 305(b) Water Quality Report.

This 2008 Section 305(b) report incorporates the most recent WI/PWL assessments that are available for each basin. In recent years, New York State deviated from the year three assessment portion of the rotating schedule, largely due to a lack of resources. An update schedule (figure 2; page 10) has been proposed; updated assessments for the entire state will be available for the next (2010) Section 305(b) reporting cycle.

This report incorporates New York State's Consolidated Assessment and Listing Methodology. This methodology outlines in considerable detail its process for evaluating the quality of the state's waters. An additional objective of the methodology is to improve the consistency of assessment and listing decisions. Much of the water quality assessment information in this report is drawn from the PWL. In accordance with EPA Integrated Report guidance, some tables and figures use the EPA Designated Use Support categories. The relationship between WI/PWL and EPA designated use categories is further explained in the assessment methodology.

The full Assessment Methodology is found in Chapter 2 and the Listing Methodology in Chapter 3.

## Overall Use Support

Overall use support for various types of waterbodies in New York State are as follows (as drawn from the PWL):

- More than half (approx. 55%) of the 87,389 miles of New York State river and stream miles are assessed. Approximately 6% are categorized as being *Impaired Waters* that do not fully support their designated use, with about 5% of river/stream miles on the 2008 New York State Section 303(d) List. Twenty-four percent of river/stream miles have been assessed as having *No Known Impacts*, while approximately 17% have *Minor Impacts*. Seven percent of river/stream miles *Need Verification* to determine standards attainment/use support. Forty-five percent remain *UnAssessed*, however, as the PWL process continues to cycle though the state this number will diminish.

- Forty-four percent of New York State lake and reservoir acres are categorized as being *Impaired or Threatened Waters* that do not fully support designated uses, with the majority of these waters included on the 2006 Section 303(d) List. However, much of the lake impairment in the state is due to a few large waterbodies that support many uses but have lakewide restrictions for a specific use. For example, while Lake Champlain supports drinking water use and a variety of recreational activities, a limited fish consumption advisory for the entire lake accounts for a significant portion of the impaired lake acres in the state. Three percent of lake/reservoir acres have been assessed as having *No Known Impacts,* while 31% have *minor impacts.* Three percent of lake/reservoir acres *Need Verification*. Only 20% of lake/reservoir acres in the state are *UnAssessed* at this time.

- About 34% of New York State estuary waters are categorized as *Impaired*; 15% (total estuary) of these waters are on the 2008 Section 303(d) List. Of the waters listed approximately 94% are impaired as a result of fish consumption and shellfishing advisories. Nearly all the remaining estuary waters in the state have been assessed as having *No Known* or *Minor Impacts.*

- The New York State Great Lakes shoreline is categorized as being *Impaired Waters* that do not fully support designated uses, with all of these shore miles included on the 2006 New York State Section 308(d) List due to a fish consumption advisory.

- All (100%) of New York State ocean coastal waters are considered to have *No Known Impacts* and support all designated uses.

## Causes and Sources of Use Impacts/ Impairment

Information regarding the pollutants causing use impairments to specific waterbodies and the sources of those pollutants/causes are tracked by the WI/PWL database. Both major and minor, or secondary causes and sources are noted. An assessment of pollutant sources and their relationship to the frequency and severity of use impairment is presented in Figure 2 on page 5.

*Major* pollutants/sources are identified as the principal contributor to a primary use impairment.

*Minor* pollutants/sources either 1) relate to a secondary impairment, or 2) are a lesser contributor to a primary impairment.

An overall assessment of the water quality problems and issues that are of greatest significance in New York State can be summarized as follows.

- Industrial and municipal point sources continue to be relatively minor sources of water use impairment; their impact on water quality has diminished significantly in the past 30 years. This has been accomplished through the State Pollutant Discharge Elimination System (SPDES) permit program. Currently, only 4% of the state's rivers and streams and 2% of lakes and reservoirs are impaired due primarily to permitted Industrial, Municipal and Private, Commercial, Institutional facility sources. The most significant effect is seen in the state's estuaries where 11% are impaired due to municipal discharge sources.

- Nonpoint sources are a significant contributor to water quality impacts in New York State. Nonpoint sources account for 90% of the major sources contributing to the water quality impacts of rivers and streams, 92% for lakes and reservoirs, 87% for estuary waters, and 100% for the Great Lakes shoreline.

- About 2,800 river miles and 331,000 lake acres are significantly affected by toxic pollutants. For the Great Lakes shoreline and estuary waters, the main contribution to water quality impacts are from toxic causes. Priority organics (PCBs), pesticides and heavy metals in bottom sediments, and atmospheric deposition are responsible for virtually all of these impacts. Although dredging projects across the state are either in the planning process or have been undertaken to remove contaminated sediments, atmospheric deposition issues remain a national issue and concern that will require federal involvement for resolution, as much of the source of this problem originates outside of New York State.

- About one-third of the state's population rely on groundwater as their source of residential drinking water. Often, the manufacture, use or disposal of products demanded by society present a risk of contamination to the groundwater many New York residents depend on. The numerous groundwater protection related state programs and initiatives outlined in Appendix B of this report highlight the threats and extensive efforts New York State undertakes in pursuit of groundwater protection.

- Agricultural activity is a frequently cited nonpoint source of water quality impact/use impairment and threat to New York State rivers, lakes, and reservoirs. Agricultural sources contribute excess nutrients and silt to waterbodies which cause excessive weed and algae growth that can impair recreational uses. Silt and sediment loads result in excessive turbidity which can impair recreation, aquatic life use support and water supply uses.

- Streambank erosion is the second most frequently cited source of water quality impact/impairment in rivers and streams. Unstable streambanks contribute excessive sediment loads to rivers and streams which can affect aquatic life, fish survival and spawning. Although it appears as a significant contributing source for nearly half the impacted/impaired rivers and streams, streambank erosion is more likely to result in stresses than impairments to water uses.

- More than 80% of impacted/impaired estuary waters cite *Other Sources* as contributing pollutants. The most significant of these Other Sources are migratory fish species and boat

pollution. In addition, contaminated sediments and wet weather impacts are also cited as primary sources of water quality impairment in the estuary waters of New York State. The migratory fish species result in fish consumption advisories for large portions of the marine waters in the state. Shellfishing is considered a designated use for 83% of the estuary waters. Approximately 76,000 acres are considered not supporting shellfishing. Pathogens from wet weather impacts and boat pollution contribute to shellfishing restrictions in and around marinas and other recreational areas.

Table 1

**Major Sources/Causes of Water Quality Impact/Impairment (by severity)**

The series of bar charts on this page indicate what pollutant sources are most frequently cites as major sources of water quality impacts/impairments in New York State (as a % of total waterbody length/area included on the PWL). For each source, frequency data is fruther segregated by the severity of water quality impact/impairment (**T**hreatened, **S**tressed, **I**mpaired, **P**recluded). Separate charts are presented for three of five waterbody types. Not represented below are Great Lakes Shoreline, 90% of which are listed as a result of fish consumption advisories due to contaminated Lake Ontario sediments, and Atlantic Ocean Coastline, none of which are on the PWL.

| | Rivers/Streams | | | | Lakes/Reservoirs | | | | Estuary Waters | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | S | I | P | T | S | I | P | T | S | I | P |
| Agriculture | 1.6 | 31.1 | 3.9 | 0.2 | 1.7 | 13.0 | 5.7 | 0.0 | 1.7 | 12.5 | 5.7 | 0.0 |
| Atmospheric Dep. | 0.0 | 1.9 | 2.4 | 2.1 | 0.0 | 0.1 | 38.0 | 0.6 | 0.0 | 0.0 | 7.0 | 7.0 |
| Chemical Leak/Spill | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Construction | 0.3 | 1.7 | 0.2 | 0.0 | 0.0 | 0.1 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CSO | 0.0 | 1.0 | 1.0 | 0.1 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 8.5 | 8.1 |
| Deicing (stor/appl) | 0.3 | 2.0 | 0.5 | 0.0 | 0.0 | 0.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Habitat Modification | 0.0 | 8.4 | 2.3 | 0.0 | 0.0 | 12.0 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydro Modification | 1.1 | 5.0 | 2.8 | 0.0 | 0.0 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Industrial | 0.0 | 1.9 | 1.0 | 0.2 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Landfill/Land Disp. | 0.2 | 0.2 | 1.4 | 0.6 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Municipal | 0.2 | 6.2 | 4.2 | 0.0 | 0.0 | 0.0 | 17.0 | 0.0 | 0.0 | 3.2 | 2.8 | 7.3 |
| On-Site/Septic | 0.3 | 3.0 | 3.7 | 0.0 | 2.8 | 1.4 | 1.5 | 0.0 | 0.0 | 0.0 | 1.2 | 0.2 |
| Other Source | 1.0 | 1.8 | 0.6 | 0.0 | 18.9 | 1.8 | 2.3 | 0.0 | 0.0 | 56.0 | 24.8 | 10.4 |
| Private/Comm/Inst | 0.3 | 1.3 | 0.6 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Power Generation | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Roadbank Erosion | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Resource Extraction | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Streambank Erosion | 1.9 | 24.8 | 3.4 | 0.0 | 0.0 | 0.5 | 7.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tox/Contam Sediment | 0.0 | 0.2 | 2.8 | 1.1 | 0.0 | 0.0 | 21.0 | 0.0 | 0.0 | 2.8 | 6.6 | 0.6 |
| Silviculture | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Sanitary Dschg. | 0.0 | 1.0 | 1.3 | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 4.4 | 11.5 | 10.0 |
| Unknown Source | 0.0 | 0.9 | 0.7 | 0.0 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Urban/ Storm Runoff | 0.9 | 11.9 | 4.8 | 0.2 | 0.4 | 10.0 | 8.3 | 0.0 | 0.0 | 10.5 | 12.4 | 10.5 |

**Trends in Water Quality Assessment**

| Table 2 New York State Waterbody Inventory | | |
|---|---|---|
| **Waterbody Type** | **Number of Segments** | **% of Waterbody Inventory** |
| Rivers and Streams | 2355 | 50.0% |
| Lakes and Reservoirs *(> 6 ac.)* | 2112 | 44.5% |
| Estuaries | 235 | 5.0% |
| Atlantic Ocean Coastline | 6 | < 1.0% |
| Great Lakes Shoreline | 35 | < 1.0% |
| **Total** | **4743** | **100.0%** |

From its beginnings in the early 1980s, the Priority Waterbodies List (then the Priority Waters Problems List) focused on assessing waters with known or suspected water quality problems. However, in 1996 modifications were made to the PWL assessment program, the goal of which was to produce a more comprehensive assessment of *all* waters of New York State. As a result, the PWL assessments available in 2002 covered a significantly higher number of river miles and lake and estuary acres than were assessed in 1996. This trend towards a comprehensive assessment of all waters (which allows for the identification of waters that support uses in addition to "problem" waters) provides a more accurate picture of water quality, and represents a significant enhancement to the water quality program. The georeferencing of all discrete assessment units and the subsequent segment size re-calculation makes comparing percent assessed from 2006 to 2008 somewhat difficult, though significant progress continues to be made toward achieving 100% assessment of all waterbodies in the state.

| Table 3 Extent of Water Quality Assessment Coverage | | | | |
|---|---|---|---|---|
| **Waterbody Type** | **Year** | | | **Percent of Waterbody Size in Entire State** |
| | **2002*** | **2006*** | **2008**** | |
| Rivers/Streams | 9,360 mi. | 32,444 mi. | 48,469 mi. | 55% |
| Lakes/Reservoirs | 250,000 ac. | 528,936 ac. | 561,267 ac. | 82% |
| Estuary Waters | 979,000 ac. | 979,000 ac. | 979,654 ac. | 100% |
| Ocean Coastline | 120 miles | 120 mi. | 118 mi. | 100% |
| Great Lakes Shore | 457 miles | 577 mi. | 407.3 mi | 100% |

Values from:

*Digital Line Graph estimates provided by USEPA computed from USGS 1:100,000 series maps (NYSDEC, 1992)

**Derived from National Hydrography Dataset, 1:24,000 (USGS, 2007)

Although comprehensive assessment goals have not been fully realized throughout the state, considerable progress has been made, with less than half of river segments and less than twenty percent of lake segments remaining unassessed (Table 3). As the WI/PWL reporting process continues to cycle, each basin will move toward 100% assessment. Drainage basins with less than half of river miles or lake acreage assessed are scheduled for update in 2008 (Table 4, Figure 2). It is important to note that, although the number of river miles and lake acreage reported as impaired or threatened may have increased over the last several years, this is more a function of both having a greater number of segments assessed, and a more accurate evaluation of segment size, than any trend toward diminished water quality.

**Table 4** **Water Quality Assessment by Drainage Basin** April 2008

| | % Assessed by Waterbody Type | | | | |
|---|---|---|---|---|---|
| **Basin** | **River/ Stream (mi.)** | **Lake/ Reservoir (ac.)** | **Estuary (sq.mi)** | **Great Lakes Shoreline (mi.)** | **Atlantic Ocean Coastline (mi.)** |
| Allegheny River | 59% | 73% | n/a | n/a | n/a |
| Atlantic Ocean/Long Island Sound | 68% | 61% | 100% | n/a | 100% |
| Black River | 67% | 59% | n/a | n/a | n/a |
| Chemung River | 81% | 87% | n/a | n/a | n/a |
| Delaware River | 77% | 60% | n/a | n/a | n/a |
| Genesee River | 62% | 79% | n/a | n/a | n/a |
| Housatonic River | 0% | 11% | n/a | n/a | n/a |
| Lake Champlain | 63% | 95% | n/a | n/a | n/a |
| Lake Ontario | 57% | 94% | n/a | 100% | n/a |
| Lower Hudson | 24% | 65% | 100% | n/a | n/a |
| Mohawk River | 76% | 70% | n/a | n/a | n/a |
| Niagara River/Lake Erie | 72% | 52% | n/a | 100% | n/a |
| Oswego River | 51% | 98% | n/a | n/a | n/a |
| Ramapo River | 45% | 49% | n/a | n/a | n/a |
| St. Lawrence River | 18% | 42% | n/a | n/a | n/a |
| Susquehanna River | 47% | 81% | n/a | n/a | n/a |
| Upper Hudson River | 59% | 74% | n/a | n/a | n/a |