



2010 Section 305(b) Water Quality Report

Water quality reporting under the Clean Water Act (CWA) Section 305(b) and Section 303(d) are highly visible ways of communicating to the public about the health of the nation's waters. Under Section 305(b), states are required to periodically report on the quality of all water resources in the state and whether these waters are fully supporting water supply use, recreation activities and aquatic life. Section 303(d) requires states to identify waters of the state where water quality standards are not met and where uses are not supported. The Section 303(d) List includes those waters (and associated pollutants) that do not support uses, *and which require development of a Total Maximum Daily Load (TMDL) strategy*. Because the Section 303(d) List of Impaired/TMDL Waters is concerned with only impaired waters - and within the universe of impaired waters, only those impaired waters that can be addressed with a TMDL strategy - the Section 305(b) Report provides a more comprehensive assessment of statewide water quality.

2010 Section 305(b) Water Quality Report

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 of these 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.

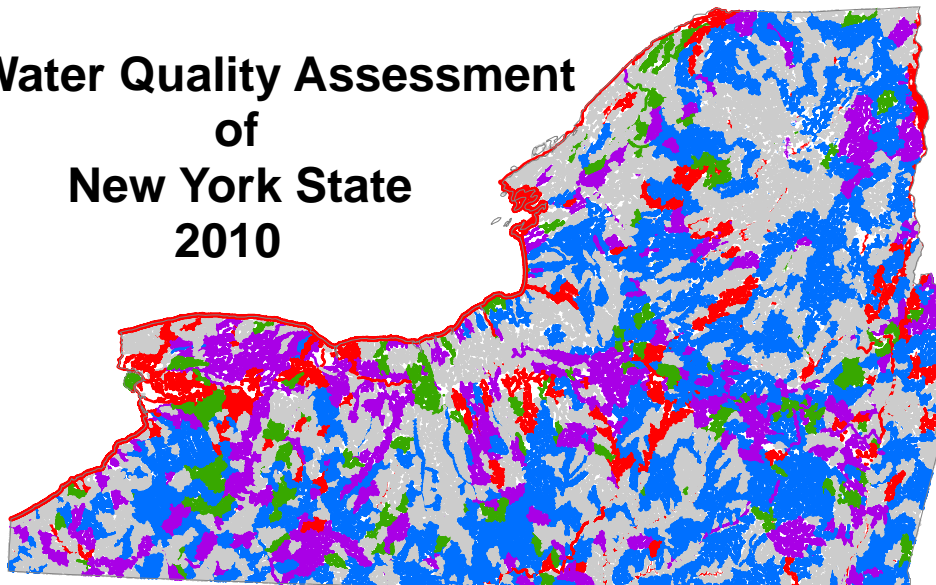
The New York State Department of Environmental Conservation (NYSDEC) Division of Water maintains an extensive inventory/database of these waters. The *Waterbody Inventory/Priority Waterbodies List (WI/PWL)* provides waterbody-specific summaries of water quality conditions, tracks the degree to which 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 serves as the basis for this *Clean Water Act Section 305(b) Water Quality Report*.

Water Quality Assessment Map






An overview [map](#) on the following page shows current water quality conditions in New York State. The map shows how the waters of the state correspond to five assessment categories:

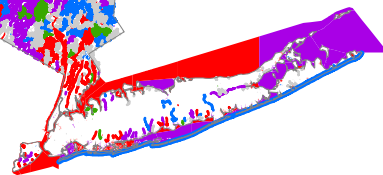
- Impaired Waters
- Waters with Minor Impacts
- Waters with No Known Impacts
- Waters Needing Verification of Impact
- UnAssessed Waters

Water Quality Assessment of New York State 2010



Water Quality Assessment Categories

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

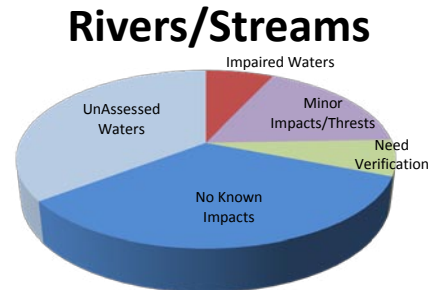


Overall New York State Water Quality

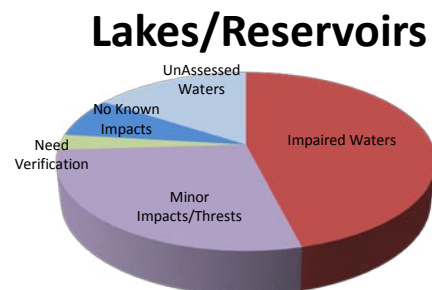
Overall use support for various types of waterbodies in New York State is as follows:

Rivers and Streams: Nearly two-thirds (65%) of the 87,124 miles of New York State river and stream miles are assessed. Approximately 7% are categorized as being *Impaired Waters* that do not fully support their designated use, with about 6% of river/stream miles on the 2010 New York State Section 303(d) List. About 17% of river/stream miles are assessed as having *Minor Impacts or*

Threats but still support uses, while nearly 7% of these waters *Need Verification* of impact to determine standards attainment/use support. One-third of rivers/stream miles have *No Known Impacts*. About 35% percent remain *UnAssessed*; this percentage of UnAssessed waters is down from 45% in 2008.

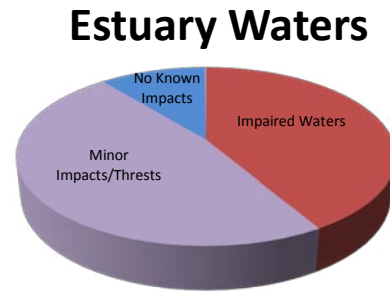


Lakes and Reservoirs: Nearly half (46%) of New York State lake and reservoir acres are categorized as *Impaired Waters* that do not fully support designated uses; 37% of state acres are included on the 2010 Section 303(d) List. However, much of the lake impairment in the state is due to a few large waterbodies that support most 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 over one-quarter of the impaired lake acres in the state. About 28% of lake acres have *Minor Impacts or Threats* but still support uses, while 3% of these waters *Need Verification* of impact to determine standards attainment/use support. Only 7% of lake acres have *No Known Impacts*. About 16% percent remain *UnAssessed*; this percentage of Unassessed waters is down from 20% in 2008.



Estuary Waters: About 41% of New York State estuary waters are categorized as *Impaired Waters* that do not fully support uses; most (38%) are on the 2010 Section 303(d) List. Most (over 90%) of the *Impaired Waters* are the result of fish consumption; shellfishing

impairment occurs in about one-quarter of *Impaired Waters*. Other uses such as public bathing, recreation and aquatic life are supported in over 90% of estuary waters. About half (48%) of estuary waters have Minor Impacts or Threats but still support uses. Only about 11% of estuary waters have *No Known Impacts*.



Great Lakes Shoreline: 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 2010 New York State Section 308(d) List due to fish consumption advisories.

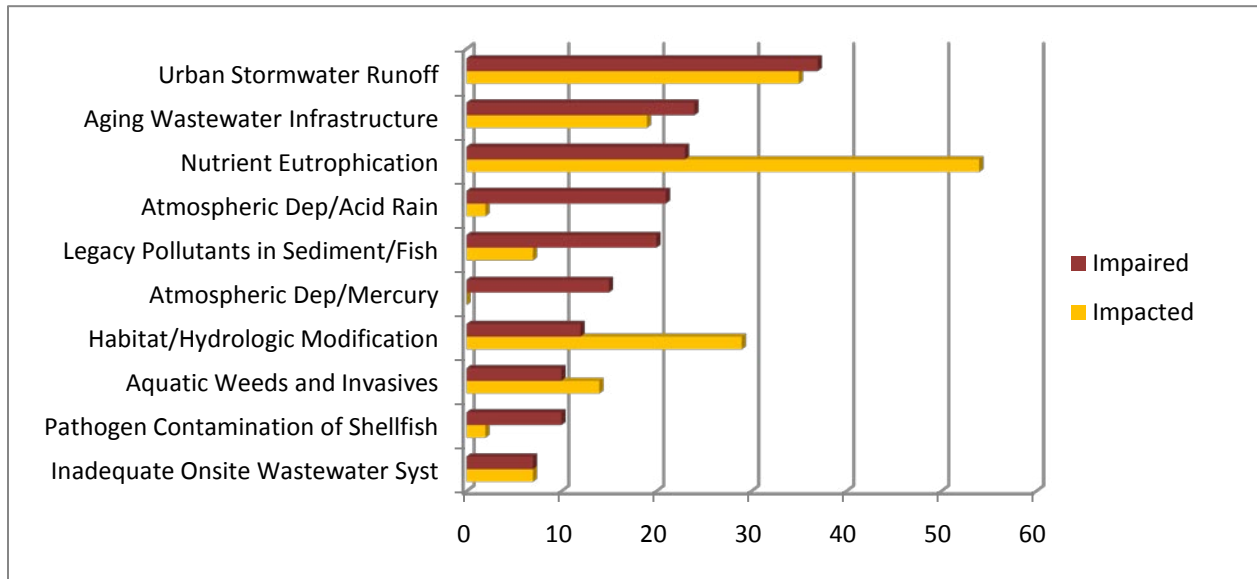
Atlantic Ocean Coastline: All (100%) of New York State ocean coastal waters are considered to have *No Known Impacts* and support all designated uses.

Top Ten Water Quality Issues in New York State

The NYSDEC Water Quality Assessment Program has identified the Top Ten most prevalent causes/sources of water quality impact/impairment in the assessed waters of New York State. These are:

- Urban Stormwater Runoff
- Aging/Inadequate Wastewater Treatment Infrastructure
- Nutrient Eutrophication
- Atmospheric Deposition and Acid Rain
- Legacy Pollutants in Sediments and Fish
- Atmospheric Deposition of Mercury
- Habitat/Hydrologic Modification
- Nuisance Aquatic Weed Growth and Invasive Species
- Pathogen Contamination of Shellfish
- Inadequate Onsite Wastewater Treatment

The figure below shows the frequency for which a specific cause/source is noted as a significant contributing factor in New York State waters. The figure shows the occurrence of each cause/source as a percentage of all waters assessed as impaired (red) or impacted (yellow).



Note: Frequency totals do not equal 100% because categories are not mutually exclusive.

Each of these causes/sources is discussed in greater detail on individual [Fact Sheets](#). These fact sheets outline the nature of the specific problem, the significance of the problem, what New York State waters are most susceptible to the problem and what is being done to address the problem.

Waterbody Inventory and Assessment Coverage

Originally the New York State water quality assessment effort focused on assessing waters with known or suspected water quality problems. However beginning in the mid-1990s and continuing through the present, that focus has shifted to producing a more comprehensive and representative assessment of all the waters of the state. Although the comprehensive assessment goals have yet to be fully realized, considerable progress has been made toward the assessment of 100% of the waters of the state.

Waterbody Type	Amount of Assessed Waterbody				Percent of Assessed Waterbody
	2002	2006	2008	2010	
Rivers/Streams	9,360 mi	32,444 mi	48,469 mi	56,269 mi	65%
Lakes/Reservoirs	250,000 a	528,936 a	561,267 a	578,124 a	84%
Estuary Waters	1530 sq mi	1530 sq mi	1530 sq mi	1536 sq mi	100%
Gr. Lakes Shore	457 mi	577 mi	577 mi	592 mi	100%
Ocean Coastline	118 mi	118 mi	118 mi	118 mi	100%

Water Quality Trends in New York State

The increase in the number of assessed waters over the past 10 to 15 years can complicate the identification of trends in the quality of New York State waters. Considerable anecdotal and intuitive knowledge, as well as numerous waterbody-specific case studies, reflect remarkable water quality improvement since the passage of the Clean Water Act in 1972. However those improvements are not always reflected in the number of impaired or impacted waters, which typically increase with each assessment. For the most part, this increase in the number of impaired/impacted waters parallels the increase in the number of assessed waters. That is, as more waters are monitored, waters in all categories are likely to increase.

For example, the number of impaired waterbody listings on the New York State Section 303(d) List increased by 5%; from 787 in 2008, to 828 in 2010. On the surface, this does not suggest progress toward improving water quality. However this increase is largely the result of previously UnAssessed waterbodies that are not necessarily newly impaired, but have only been recently identified as such. This observation is not intended to minimize the importance of these new listings, but to point out that the additions do not necessarily reflect a declining trend in statewide water quality, but rather reflect an increase in the coverage of the monitoring and assessment effort. For additional perspective, note that over the same two year period the number of waterbodies assessed as having No Known Impacts increased by 44%, from 680 to 977.

A better assessment of water quality trends is the NYSDEC report *Thirty Year Trends in Water Quality of Rivers and Streams in New York State* (2004). Since 1972, the NYSDEC Stream Biomonitoring Unit has been using benthic macroinvertebrate communities to monitor and assess water quality in the rivers and streams of New York.

Macroinvertebrates are aquatic insects such as mayflies, stoneflies and caddisflies, worms, clams, snails and crustaceans. Because these biological communities have been sampled using the same technique at over 1,500 sites in New York over 38 years, this data lends itself well to determining temporal trends in water quality. The Thirty Year Trends study shows a number of trends that have ramifications for the restoration and protection of waters into the future. Among these findings:

- Severely impacted streams declined from 8% of all streams sampled in the 1970s to 4% in the 1992 to only 1% in 2002. This trend suggests that the most severe water quality impacts are being addressed.
- From 1972 to 1992, 38% of sites improved while 4% showed declines in water quality (58% did not change significantly). However the results for the period between 1992 and 2002 show 20% of sites improved, while 19% declined (61% did not change).
- For the improved sites, nearly two-thirds (64%) were attributable to improved wastewater treatment or the elimination of municipal and/or industrial discharges. This reflects a level of success achieved by programs aimed at point source control of pollutants.
- An examination of the sites where water quality declined over that same period shows that most declines (63%) are attributable to previously non-impacted sites becoming slightly impacted. It is also noted in these cases that most (76%) of the declines were the result of nonpoint source nutrient enrichment.
- About one-quarter (24%) of the declines in water quality are the result of organic wastes and municipal and industrial wastewater inputs.

These findings also reveal interesting conclusions. It is encouraging to note that most of the declines can be characterized as minor in that they do not represent the loss of uses associated with impaired waters. However they are declines nonetheless, and more needs to be done to maintain high water quality in the state. Also the fact that the cause of the declines is largely a result of nonpoint sources provides additional support for current

NYSDEC efforts to address stormwater runoff, agricultural impacts from Concentrated Animal Feeding Operations (CAFOs) and other programs aimed at nonpoint sources.

The secondary cause of water quality declines – organic wastes and municipal and industrial wastewater inputs – suggest aging wastewater treatment infrastructure is a significant source. Many wastewater treatment plants were built or upgraded in the 1970s and early 1980s and are no longer functioning beyond capacity or at reduced levels of efficiency.

In a larger sense, these findings reflect a need to balance efforts to restore water quality that has been significantly diminished with a comparable effort to provide protection to threatened or higher quality waters. Impaired waters that do not support aquatic life and recreational uses are an obvious priority for today's water quality managers. However, additional attention to maintaining good quality waters and protecting waters that are threatened can be a more effective use of limited funding. And such investment may result in fewer water quality problems for future water quality managers.



Top Ten Water Quality Issues in New York State

Urban Stormwater Runoff

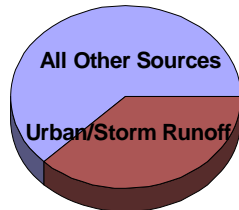
The Problem...

Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces such as paved streets, parking lots and rooftops and does not seep into the ground. Consequently, it accumulates and transports chemicals, nutrients, sediment or other pollutants and debris. If the runoff is not captured or it is discharged without first being treated, it can adversely affect water quality in the receiving lakes, rivers and estuaries.

The impact from stormwater runoff is a more significant problem in urban and developed areas where there is a greater percentage of impervious surfaces. There are numerous Best Management Practices (BMPs) designed to capture and treat stormwater, however retrofitting these approaches in long-established urban areas can be technically challenging and costly.

The Significance...

Urban stormwater runoff is identified as a major source in 37% of all waterbodies assessed as impaired in New York State. In another 40% of impaired waterbodies, urban stormwater runoff is a contributing source (though not the most significant source). In addition, for 35% of the waters with less severe minor impacts or threats urban stormwater runoff is noted as a major contributing source of impact.



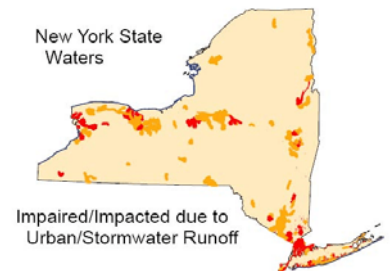
However, if atmospheric deposition of pollutants (acid rain, mercury) and legacy pollutants in river and lake sediments (PCBs, dioxin) – sources that are largely beyond the control of water programs – are not considered, urban/stormwater runoff is cited as a contributing source in 75% of all impaired waters and a major contributing source in 61% of impaired waters in the state.

In addition to being cited as a major source in one-third of all impaired waters, urban/stormwater runoff is noted as a major source of contaminants in 36% of all waters that experience lesser, but measurable, minor impacts to water quality, and a contributing source in nearly half (47%) of waters with minor impacts.

Specific Waters...

Waters that are impaired or impacted by urban stormwater runoff occur throughout New York State.

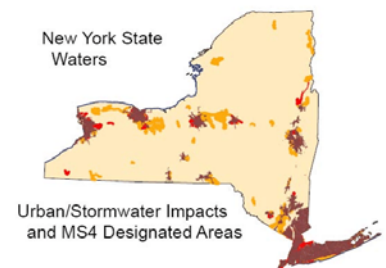
Not surprisingly, however, such waters are most likely to occur in and around the major metropolitan areas of the state, such as New York City, Buffalo, Syracuse, Rochester, Albany and other population centers.



What is Being Done...

Because of the impacts of stormwater on water quality, stormwater control has become a significant NYSDEC Water Program initiative. The cornerstone of this effort is implementation of the Phase II stormwater regulations, which require permits for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s) in urban areas. NYSDEC has issued a general permit for MS4s in urban areas requiring that these municipalities develop a Stormwater Management Plan (SWMP) that includes identification of Best Management Practices (BMPs) to be implemented, as well as public education and reporting components.

The MS4 areas, where much of the NYSDEC stormwater effort is concentrated, coincide closely with waters that are impaired and impacted by stormwater runoff.



More Information

NYSDEC Stormwater Control Program

<http://www.dec.ny.gov/chemical/8468.html>

US Environmental Protection Agency Stormwater Program

http://cfpub1.epa.gov/npdes/home.cfm?program_id=6



Top Ten Water Quality Issues in New York State

Aging Wastewater Treatment Infrastructure

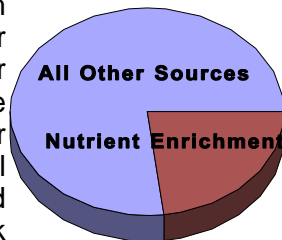
The Problem...

Across New York State over 600 wastewater treatment facilities serve more than 15 million people. These facilities range from New York City's system of 14 plants which process 1.3 billion gallons of wastewater per day, to small village systems of 100,000 gallons per day. When the Clean Water Act was passed in 1972, it was accompanied by considerable federal funding to support the construction and upgrading of these facilities to insure that impacts from municipal wastewater would be controlled. These efforts were largely successful, as the period from the 1970s through the 1980s saw significant water quality improvement across the state. However, since then funding for maintaining and upgrading these facilities has been greatly reduced. As many of these plants that reach the end of their 30- to 40-year design lives, previous water quality gains are in danger of being lost.

In addition to the treatment plants themselves, sewer systems that convey wastewater to the plants for treatment are also deteriorating. More than 30% of these systems are in excess of 60 years old. Overflows of raw sewage from these sanitary systems – as well as from older combined sewer systems that capture both sanitary wastewater and storm runoff and are designed to overflow during heavy rain and runoff events – result in considerable water quality impacts across the state.

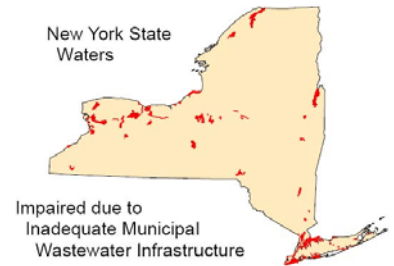
The Significance...

Discharges from municipal wastewater treatment plants and/or collection systems are identified as a major source in 24% of all waterbodies assessed as impaired in New York State. In another 12% of impaired waters, municipal sources are a contributing source (though not the most significant source). In addition, 19% of the waters with less severe minor impacts or threats note municipal wastewater as a major contributing source.



Specific Waters...

Not surprisingly, water quality impacts due to inadequate municipal wastewater treatment typically occur in the more populated areas of the state. Such impacts are of particular note in the metropolitan New York City/Long Island region of the state where municipal wastewater sources are cited as the cause of 54% of all impaired marine estuary acres. Other areas where such impacts occur include the large municipalities of Syracuse, Buffalo and Utica. However, a number of smaller municipalities across the state, where limited resources make infrastructure upgrades difficult without state or federal assistance, experience similar quality impairments and impacts.



What is Being Done...

During the 20 years from 1987 to 2008, federal Clean Water Act funding was reduced by 70%, from \$2.4 billion to \$687 million. To increase awareness of the problem and advocate for resources necessary to address the issue, NYSDEC undertook the Clean and Safe Water Infrastructure Initiative. This Initiative led to the Clean Water Collaborative which is a coalition of state and local governments, elected officials and environmental and business organizations. The collaborative identifies federal, state and local funding sources for a sustainable wastewater infrastructure program. Recent successes include \$432 million from federal stimulus legislation for wastewater infrastructure projects and a three-fold increase (\$232 million) in New York's Clean Water State Revolving Fund (CWSRF) for wastewater projects.

But beyond recent progress, it is clear that a new comprehensive and sustainable approach is needed. To that end, the initiative promotes strategies that provide incentives for infrastructure maintenance and reinvestment, water conservation, energy efficiency and innovative technology, including green infrastructure. Clearly addressing our infrastructure needs is both a financial and technical challenge.

More Information

NYSDEC Wastewater Infrastructure Needs Report
<http://www.dec.ny.gov/chemical/42383.html>
NYS Environmental Facilities Corporation Funding
<http://www.nysefc.org/home/index.asp?page=100>



Top Ten Water Quality Issues in New York State

Nutrient Loadings and Eutrophication

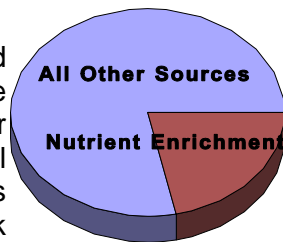
The Problem...

While waterbodies require nutrients to support healthy ecosystems, excessive nutrients, or eutrophication, can harm water supplies, recreational uses and aquatic life. High levels of nitrogen and phosphorus in waters can produce nuisance algal blooms and increase aquatic weed growth (see also *Aquatic Weed Growth and Invasive Species*). Excessive algal and weed growth reduces water clarity and the recreational value of a waterbody. In addition, nutrients and resulting plant growth can draw oxygen from the water and produce "dead zones" where dissolved oxygen levels are so low that aquatic life cannot survive. This condition is referred to as hypoxia.

One of the reasons nutrients are such a problem is because the sources of phosphorus and nitrogen are so prevalent. Sources and practices that result in excessive nutrients in waterbodies include: municipal wastewater treatment plant discharges, urban runoff from impervious surfaces such as parking lots, lawns, rooftops and roads, agricultural activities that result in animal waste and sediments washing into waterbodies, flow from inadequate onsite septic systems, and atmospheric deposition.

The Significance...

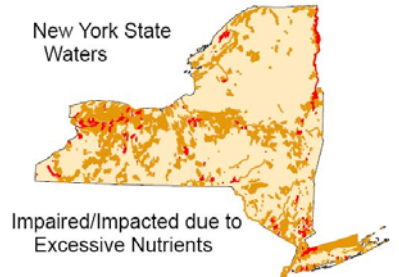
Excessive nutrients and eutrophication are identified as a major source in 23% of all waterbodies assessed as impaired in New York State. In another 29% of impaired water, nutrients and eutrophication are contributing sources (though not the most significant sources).



In addition, for 54% of the waters with less severe minor impacts or threats nutrients and eutrophication are noted as major contributing sources of impact. Additionally, 9% of impaired waters show nutrients as a lesser contributing source in waters with minor impacts/threats.

Specific Waters...

Impaired waters (shown in red) or impacted/threatened waters (shown in orange) due to nutrients are fairly widespread across New York State. This broad distribution is a result of the multiple sources of nutrients to the waters of the state.



Municipal wastewater discharges and urban/storm runoff are the primary sources in more developed urban areas. Agricultural runoff, inadequate onsite septic systems, and other nonpoint sources contribute nutrients to waters in less populated rural areas. Nitrogen is the nutrient of greatest concern in and around Long Island and New York City marine waters, while phosphorus is typically the cause of enrichment in fresh waters of the state.

What is Being Done...

Recognizing the multiple and varied sources of nutrients to the waters of the state, NYSDEC has a number of programs in place aimed at reducing nutrient loadings. A comprehensive stormwater program focuses on runoff from urban areas and construction activities. Nutrient management from agricultural sources is the focus of the Concentrated Animal Feeding Operations (CAFO) program. And waterbody-specific nutrient reduction and allocation strategies, known as Total Maximum Daily Load (TMDL) plans, have been developed for Long Island Sound, Lake Champlain, waters of the Croton River watershed and a number of lake watersheds.

NYSDEC is also developing more specific statewide water quality criteria for nutrients in lakes and rivers to protect drinking water supplies, recreational use and aquatic life. This is part of a national effort initiated by USEPA to address nutrient pollution, which causes significant and increasing impacts in waters all across the country.

More Information

NYSDEC - Nutrients Standards Plan

http://www.dec.ny.gov/docs/water_pdf/nutrientstandards.pdf

USEPA - Nitrogen and Phosphorus Pollution

<http://www.epa.gov/waterscience/criteria/nutrient/>



Top Ten Water Quality Issues in New York State

Atmospheric Deposition and Acid Rain

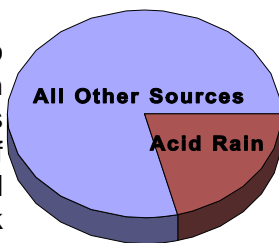
The Problem...

Acidic deposition, or acid rain, originates from the combustion of fossil fuels. When coal, oil, or other fossil fuels are burned, acid rain precursors--mainly nitrogen oxides (NO_x) and sulfur dioxide (SO₂)--are emitted into the atmosphere. Once in the atmosphere, NO_x and SO₂ are transformed into nitric acid and sulfuric acid and fall back to earth through both wet deposition such as rain, snow, fog, cloud water, and dry deposition of acids attached to particles, gases and aerosols. Rain and snow are somewhat naturally acidic due to the combining of carbon dioxide and water vapor in the air, which forms weak carbonic acid. However, the average acidity of rainfall in New York State is up to 30 times greater than the level typically found in rainwater.

Increased acidity has a negative effect on water quality and aquatic life. Various insects that constitute an important food source for fish—such as mayflies—are sensitive to low pH. Low pH also increases the concentration of heavy metals—such as aluminum and mercury—in the water, and can result in increased toxicity to aquatic life.

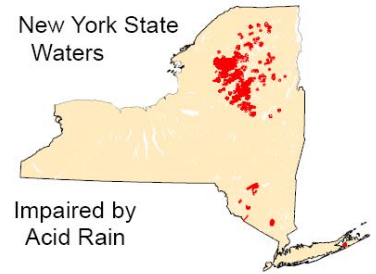
The Significance...

Low pH due to atmospheric deposition of acid rain is identified as a major source in 21% of all waterbodies assessed as impaired in New York State. However the actual impact of acid rain on the waters of New York may be somewhat greater than this figure reflects. Acid rain is more likely to affect smaller lakes and ponds, many of which are not tracked individually and/or are assessed with much larger waterbodies. The 2010 Section 303(d) List of Impaired Waters includes 72 additional lakes of less than 6.4 acres that have been identified as impaired by acid rain but that are not tracked separately in the Waterbody Inventory database.



Specific Waters...

While acid rain falls throughout New York State, many areas are less sensitive to acidity because of limestone deposits or the buffering capacity of surrounding soils which neutralize the acid. However the lack of buffering ability in the soils and bedrock of the Adirondacks, Catskills, Hudson Highlands, and Rensselaer Plateau make these areas particularly sensitive to acid rain. In fact small mountain lakes and streams of the Adirondacks and Catskills have emerged as “poster children” for the effects of acid rain.



What is Being Done...

Efforts in New York to reduce emissions which contribute to acidic deposition began in 1984 with passage of the first Acid Deposition Control Act in the nation. However even then it was clear that the state could not solve the acidic deposition problem by itself, due to the significant impact of air emissions originating primarily in the Midwest. It was reported at the time that over 80% of the sulfur deposition that occurred in the southwestern Adirondacks originated outside of New York State.

The state's early action precipitated national efforts to reduce levels of sulfur dioxide and nitrogen oxides. Title IV of the Clean Air Act of 1990 set a permanent cap on the total amount of SO₂ electric utility emissions at about half the amount emitted in 1980. NO_x emission-rate limitations for coal-fired electric utility units have resulted in a 27% reduction from 1990 levels.

However, in spite of these reductions, continued damage to sensitive ecosystems led New York State to require additional emissions reductions through the Acid Deposition Reduction Program (ADRP) in 2004. With the ADRP, as well as the federal Clean Air Interstate Rule aimed at control of acid rain nationwide, further reduction in acidic deposition should be forthcoming.

More Information

NYSDEC Acid Rain Management
<http://www.dec.ny.gov/chemical/283.html>
Adirondack Lakes Survey Corporation
<http://www.adirondacklakessurvey.org/>



Top Ten Water Quality Issues in New York State

Legacy Pollutants and Fish Consumption

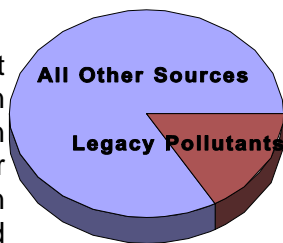
The Problem...

Prior to the routine regulation of industrial discharges and waste disposal practices that began in the 1960s and 1970s, a wide variety of toxic compounds were disposed of either by direct discharge into lakes and rivers or by disposal in landfills, many of which subsequently leaked into waterways. Since then, these originating industrial wastewater discharge and landfill sources of toxic pollutants have been largely addressed and loadings of PCBs, dioxins, mirex, DDT and other organic toxics, pesticides and heavy metals have been significantly reduced or eliminated.

However these persistent toxic chemicals continue to contaminate lake and river sediments in waters all across the state. They move from sediments through the aquatic food chain and accumulate in fish. This contamination results in health advisories that prohibit or limit the consumption by humans of fish taken from affected waters.

The Significance...

Legacy pollutants that result in fish consumption restrictions have been identified as a major source of contamination in 20% of all impaired waterbodies identified in New York State. These advisories typically restrict consumption of certain species of fish to either none at all, or no more than one meal per month.



In addition to waterbody-specific advisories, a general health advisory that recommends limiting consumption of fish from any water of the state to no more than one meal per week is also in place. This precautionary advisory reflects the understanding that some chemicals (including PCBs) are commonly found in New York State fish and that not all waters of the state have been tested.

Specific Waters...

Fish consumption advisories that are the result of legacy contamination occur in waterbodies throughout New York State. Advisories for specific waters include many of the largest and most well-known waters: Hudson River, Lake Champlain, Saint Lawrence River, New York Harbor, and the shores of Lake Erie and Lake Ontario. These advisories are generally the result of known legacy discharges of contaminants. Less stringent precautionary advisories for nearly all waters of the state, as well as additional precautionary restrictions for children and women of childbearing age, are also in place.



What is Being Done...

Contaminated sediments in waterbodies are, by their nature, diffuse sources of pollution. Consequently remediation of these sources and the restoration of fish consumption in these waters is often difficult to achieve. However, remediation activities are currently underway at sites throughout New York State. NYSDEC oversees the State Superfund and Brownfields cleanup programs and actively assists USEPA with Federal Superfund projects. The most notable of current large-scale remediation efforts linked to current fish consumption restrictions are in the Upper Hudson River and in Onondaga Lake. Other recent remediation efforts include the Grass River in Massena, Cumberland Bay on Lake Champlain, and a number of other sites on various smaller waterbodies. Remediation is planned for Utica Harbor along the Mohawk and in Eighteenmile Creek in western New York.

An extensive monitoring and modeling effort to identify the sources and movement of toxics within the New York Harbor (The Contamination Assessment and Reduction Program, or CARP) was completed in 2007 and is currently being used to develop toxic contaminant reduction strategies.

More Information

NYSDEC Fish Consumption Restrictions
<http://www.dec.ny.gov/outdoor/7736.html>
NYSDEC Environmental Remediation
<http://www.dec.ny.gov/chemical/brownfields.html>



Top Ten Water Quality Issues in New York State

Atmospheric Deposition of Mercury

The Problem...

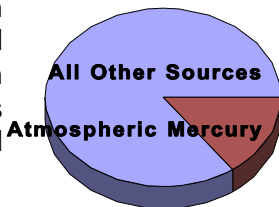
Mercury is a toxic metal that poses risks to human health when released to the environment. The most common exposure pathway is when gaseous and particulate mercury is released to the atmosphere and is then deposited onto the land and water during precipitation. Once in the water, mercury can be converted to its most toxic form, methylmercury, which accumulates in fish and aquatic organisms. Humans are exposed to methylmercury and subjected to its associated health effects when they consume contaminated fish.

In New York State as well as throughout the Northeast, wide-ranging health advisories limiting the consumption of fish are in place due to elevated levels of mercury in certain fish species. The vast majority of mercury contamination can be attributed to atmospheric deposition. However while these states have achieved regional reductions in mercury emissions and discharges of approximately 70 percent over the past decade, the lack of available options to control out-of-state sources of atmospheric mercury remains a challenge for the region.

The Significance...

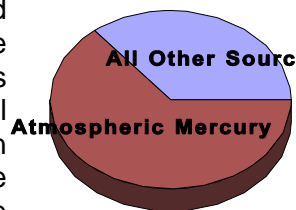
Atmospheric deposition of mercury is identified as a major source in 15% of all waterbodies assessed as impaired in New York State.

NYS Impaired Waters



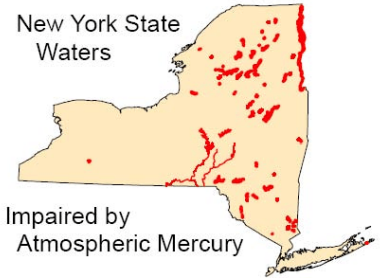
However, because these impaired waterbodies include some of the larger lakes in the state, 64% of all impaired lake acres in New York State are impaired by the atmospheric deposition of mercury.

Impaired Lake Acres



Specific Waters...

The majority of waters listed as impaired by the atmospheric deposition of mercury are located in the Adirondack and Catskill mountains. In fact, New York State has issued a regional advisory for women of child-bearing age and children limiting their consumption of fish from all Adirondack and Catskill waters for species of fish that typically have higher levels of contamination. There is also a general advisory for all freshwaters limiting fish consumption to no more than one meal per week. This advisory is issued as a precaution because some contaminants (including mercury) are more commonly found in fish and fish from many waters have not been tested.



What is Being Done...

New York State has moved aggressively to reduce the release of mercury into the environment. It has imposed mercury emission limitations on coal-fired power facilities based upon maximum achievable control technology (MACT). Under these regulations, facilities are not permitted to generate and trade mercury reductions with other facilities or states, which would be allowed under federal rules. Starting in 2015, the state will establish a facility-wide emission limit for each applicable facility. But as noted previously, much of the mercury in the atmosphere originates outside New York State. In 2007, New York, along with other northeastern states, established a pollutant reduction strategy known as a Total Maximum Daily Load (TMDL). The TMDL documented that over 97% of the mercury causing fish consumption impairment was due to atmospheric sources. Northeastern states have reduced mercury loads within their borders by 74%. However, it is not possible to meet TMDL targets without a comparable reduction in out-of-region sources. Clearly the ultimate solution to atmospheric deposition of mercury will require national or international approaches.

More Information

NYSDEC Mercury Management

<http://www.dec.ny.gov/chemical/285.html>

Northeast Regional Mercury TMDL

<http://www.dec.ny.gov/chemical/31304.html>



Top Ten Water Quality Issues in New York State

Habitat and/or Hydrologic Modification

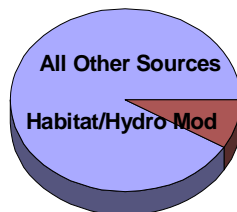
The Problem...

Habitat and hydrologic modifications include physical alterations to a stream channel and its associated corridor. Increased impervious surfaces in the stream watershed can also contribute to modification. Such modifications can interfere with the water cycle, disrupt the natural flow of water, cause increased erosion and sediment loadings, and result in a loss of suitable habitat for fish and wildlife. Common examples of such modifications to habitat or hydrology include the widening, deepening and channelization of streams, hardening of streambanks, dam and reservoir operations, poorly designed stream barriers (e.g., bridges, dams, culverts) and construction in and along stream riparian buffers and wetlands.

Despite ongoing programs aimed at restoring rivers and streams that have suffered impacts, recognition of thoughtful land use practices is only just beginning. Typically, habitat and hydrologic modification impacts—including increased erosion, higher temperatures, lower dissolved oxygen, excessive nutrient and sediment loads, degraded habitats, and the loss of property due to flooding and erosion—are the result of poor design and/or channel maintenance. However more recent emphasis on low-impact development and green infrastructure represents significant progress toward land use and development policies that may mitigate impacts of habitat and hydrologic modification on the waters of the state.

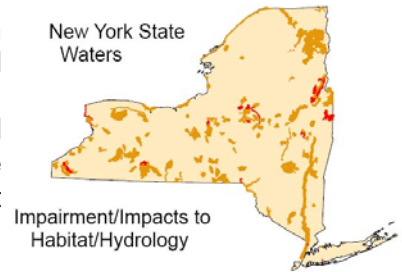
The Significance...

Habitat and hydrologic modification, including streambank erosion, is identified as a major source in 12% of all waterbodies assessed as impaired in New York State. In addition, for 29% of the waters with less severe minor impacts or threats, habitat/hydrologic modification is noted as a major contributing source.



Specific Waters...

Impaired waters (shown in red) or impacted/threatened waters (shown in orange) due to habitat and hydrologic modifications are scattered across different regions of New York State. Not surprisingly, such impacts are more likely to occur in developed or developing areas where human influences cause increased runoff and result in alterations to habitat and hydrology. In less populated areas nonpoint sources of silt and sediment from agricultural activity, road sanding during the winter or other practices can contribute to increased sediment loadings in streams and lakes, altering the water flow and aquatic habitat.



What is Being Done...

During the past decade, NYSDEC worked with a number of other state and local agencies and organizations to promote low-impact design, smart growth development and green infrastructure concepts for urban planning projects. These efforts are largely driven through implementation of the NYSDEC Phase II Stormwater Program, which requires urban municipalities to develop Stormwater Management Plans (SWMPs), implement best management practices and promote public education (see also *Urban Stormwater Runoff*). Similar programs are also in place to address runoff and sediment from construction and agricultural activity.

Efforts to coordinate other inter-agency and local activities to protect streams and habitat are led by the Hydrologic and Habitat Modifications Workgroup of the New York State Nonpoint Source Coordinating Committee. This workgroup continues to develop and promote strategies to protect the functions and natural resources of rivers and streams, minimize flooding and erosion, reduce stream barriers and advocate for the “day-lighting” of urban streams to enhance economic, recreational, and ecological benefits.

More Information

NYSDEC Stormwater Control Program

<http://www.dec.ny.gov/chemical/8468.html>

USEPA - Control of NPS Pollution from Hydromodification

<http://www.epa.gov/owow/nps/hydromod/index.htm>



Top Ten Water Quality Issues in New York State

Aquatic Weeds and Invasive Species

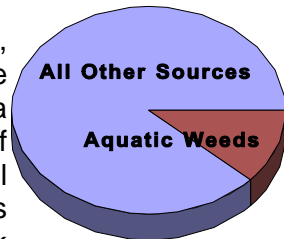
The Problem...

While rooted aquatic plants are a natural component of a healthy aquatic system, excessive weed growth can have significant negative effects on waterbodies. In addition, invasive species that alter the aquatic plant community also contribute to restriction of recreational and other uses.

Aquatic plant populations are governed by a complex interaction of physical, chemical and biological factors. These factors include light penetration into the lake, water and sediment chemistry (see also *Nutrient Loadings and Eutrophication*), growing space and the presence of invasive plants—the most common of which are Eurasian watermilfoil, water chestnut, curly leafed pondweed and fanwort. When weed growth becomes excessive resulting problems include reduced plant biodiversity, weed blooms that deplete oxygen and cause odors when they die off, alteration of fish communities from larger game fish to pan fish, and nuisance growth that can reduce circulation, clog boat propellers and hinder swimmers. Healthy waterbodies reflect an appropriate balance of adequate, but not excessive, weed growth.

The Significance...

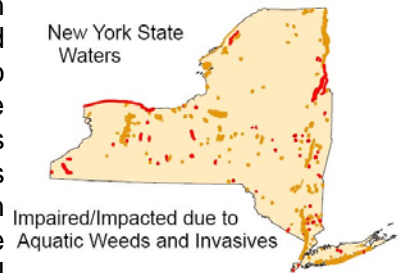
Nuisance aquatic weeds, algae and/or invasive species are identified as a major source of impairment in 10% of all waterbodies assessed as impaired in New York State. In another 6% of impaired waters, aquatic weeds/invasive plants are a contributing source of impact (though not the most significant source).



In addition, for 14% of the waters with less severe minor impacts or threats, aquatic weeds and invasive plants are noted as a major contributing source of impact. These sources are also cited as contributing to an additional 4% of other waters with minor impacts/threats.

Specific Waters...

Impaired waters (shown in red) or impacted/threatened waters (orange) due to aquatic weed growth are fairly widespread across New York State. This broad distribution is due in part to the fact that some weed growth is a normal feature of aquatic systems.



The factors that cause weed growth to become excessive—such as sources of nutrient loading and the presence of invasive plants—are also fairly common throughout the state.

What is Being Done...

Efforts to combat excessive aquatic weed growth and invasive species are underway in a number of areas. The most visible of these efforts was the creation of the Invasive Species Task Force in 2003 which brought together 17 New York State agencies and other organizations to identify actions and develop a strategy to address invasive species. The task force led to the establishment of the Office of Invasive Species within NYSDEC in 2007. Another initiative that grew out of the task force was the creation of Partnerships for Regional Invasive Species Management (PRISM). PRISM uses education, early detection, and rapid response to promote cooperative management of invasives on an integrated watershed level.

NYSDEC also has a number of programs in place aimed at reducing nutrient loadings, which promote aquatic weed growth. These include a comprehensive stormwater program, a Concentrated Animal Feeding Operations (CAFO) program, and waterbody-specific nutrient reduction and allocation strategies, known as Total Maximum Daily Load (TMDL) plans for specific lakes and other waterbodies. NYSDEC also provides assistance to local lake associations through the State Federation of Lake Associations for developing management strategies to address weed and other lake issues.

More Information

NYSDEC - Invasive Species Task Force
<http://www.dec.ny.gov/animals/6989.html>
New York State Federation of Lake Associations
<http://www.nysfola.org/>



Top Ten Water Quality Issues in New York State

Pathogen Contamination of Shellfish

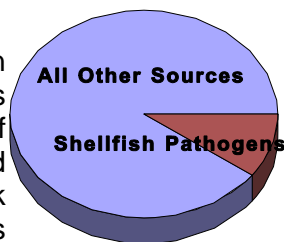
The Problem...

The marine waters of New York State support a wide variety of shellfish and a significant shellfishing industry, as well as being a valuable recreational resource. However, much of the marine waters district is adjacent to highly populated areas of the state and subject to pathogen contamination that can make shellfish unsafe to eat. As a result, shellfishing is restricted in some waters and at various times.

NYSDEC regularly evaluates and monitors shellfishing waters and classifies them as either certified or closed for shellfishing. There are three types of closures. Regulatory closures are based on the water quality of an area over a long period and are not changed often. Temporary emergency closures occur when an area that is normally open experiences sudden, short-term degradations in water quality, usually the result of a storm event or the presence of a biotoxin in the water. Once the event has passed and water quality has improved, the area is reopened. Special shellfish closures are implemented in anticipation of conditions that pose a threat to water quality, such as holidays when boating use increases.

The Significance...

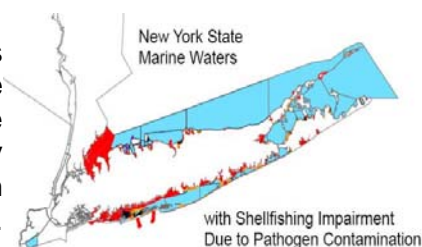
Pathogen contamination of shellfish is identified as a major source in 10% of all waterbodies assessed as impaired in New York State. Specific sources of pathogens include urban runoff, stormwater discharges, onsite septic impacts, and boating discharges.



While pathogen contamination of shellfish is responsible for only 10% of impaired waterbodies statewide, such contamination is responsible for 92% of the impairment found in waterbodies designated for shellfishing. Shellfishing restrictions affect 13% of the total estuary area classified as being otherwise appropriate for shellfishing.

Specific Waters...

Shellfishing restrictions are not a statewide issue, because shellfishing use only applies to certain marine waters. Waters that are designated for shellfishing are generally located around Long Island. The adjacent map shows areas where long-term water quality issues result in regulatory closures.



What is Being Done...

NYSDEC addresses the impact of pathogens that result in contamination of shellfish through two efforts. The first is the shellfishing management program. This effort relies on the collection of thousands of water samples each year to monitor the quality of shellfishing waters to make sure that human health is protected. If water quality is not up to New York State and national standards, DEC closes the area to shellfish harvesting.

NYSDEC is also moving forward in reducing the levels of pollutants entering the marine shellfishing waters of the state. The most significant of these is the implementation of Phase II stormwater regulations, which require permits for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4) and mandate stormwater management plans and Best Management Practices to reduce runoff. NYSDEC has also developed Total Maximum Daily Load (TMDL) plans for a number of specific shellfishing impaired waters that identify sources of contamination and set pathogen load reduction targets for these sources. NYSDEC has also worked with local agencies to establish vessel waste no discharge zones to reduce wastewater impacts from boats in marine waters.

More Information

NYSDEC Shellfish Management Program

<http://www.dec.ny.gov/outdoor/345.html>

Shellfishing Closures

<http://www.dec.ny.gov/regs/4014.html>

NYSDEC Shellfish Pathogen TMDL

http://www.dec.ny.gov/docs/water_pdf/tmdlpathshel07.pdf



Top Ten Water Quality Issues in New York State

Inadequate Onsite Wastewater Treatment

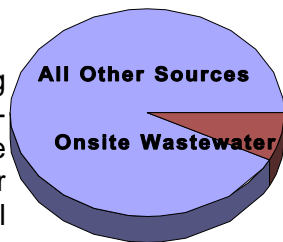
The Problem...

While most residences are connected to sewer systems and larger centralized wastewater treatment plants, about one-quarter of New Yorkers and a comparable number of businesses and institutions are served by onsite wastewater treatment systems. Onsite systems are effective and economical when properly designed, installed and maintained. However the lack of an adequate onsite system, poor routine maintenance, increased density of homes served by onsite systems, undersized and overused systems (particularly due to conversion of vacation cottages and camps into year-round residences), and the installation of systems on sites with unacceptable conditions can all lead to onsite system failure and water quality impacts.

Acute failures resulting in wastewater pooling on the ground, impacts to beaches or backups into buildings are potential health problems. Chronic problems can result in bacteria contamination of groundwater and nutrient loadings to nearby lakes and other recreational waters that spur excessive aquatic weed and algal growth (see also *Aquatic Weeds and Invasive Species*).

The Significance...

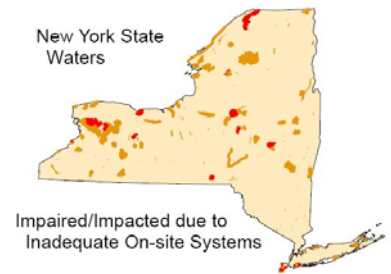
Inadequate and/or failing onsite wastewater treatment (septic) systems are identified as a major source in 7% of all waterbodies assessed as impaired in New York State. In another 20% of impaired waterbodies, onsite systems are noted as a contributing source (though not the most significant source).



In addition, for 7% of the waters with less severe impacts or threats, onsite systems are noted as a major contributing source. Failing onsite systems are also cited as the major suspected source in 11% of waters where impacts need to be verified, while also being cited as suspected contributing sources for 22% of waters needing verification of impacts.

Specific Waters...

Waters that are impaired or impacted by inadequate and/or failing onsite systems are located throughout New York State. Most such instances occur in smaller hamlets and communities that are not served by municipal collection and wastewater treatment facilities. NYSDEC has identified over 100 unsewered communities where inadequate/failing onsite systems contribute to water quality problems and where improved onsite treatment and/or a centralized community system is being sought.



What is Being Done...

Since 1990, NYSDEC has worked with USEPA, state and local health departments, municipalities, local agencies and organizations, and universities to address siting, design, construction and maintenance issues for residential and small community onsite wastewater treatment systems. The Onsite Training Network (OTN) has been established to provide wastewater treatment training events across the state to share knowledge and expertise with local officials, building inspectors and professional engineering firms.

Financing for projects to construct municipally owned decentralized wastewater treatment systems is available from the Clean Water State Revolving Fund. The fund provides low-interest funding for new projects or upgrades to address inadequate or failing systems, or to help establish sewer districts and alternative centralized treatment systems, where appropriate. However, properly functioning onsite systems typically provide effective wastewater treatment at a lower cost than centralized treatment plants, particularly in non-urban areas.

More Information

- Onsite Training Network - http://www.delhi.edu/bcs/otn_wastewater/
- NYSEFC Onsite Wastewater Treatment Systems Funding - <http://www.nysefc.org/home/index.asp?page=387>
- USEPA Onsite (Septic) Systems Information - <http://cfpub.epa.gov/owm/Septic/index.cfm>