

Susquehanna River Basin

WI/PWL Water Quality Assessment

Assessment

Lake/Reservoir

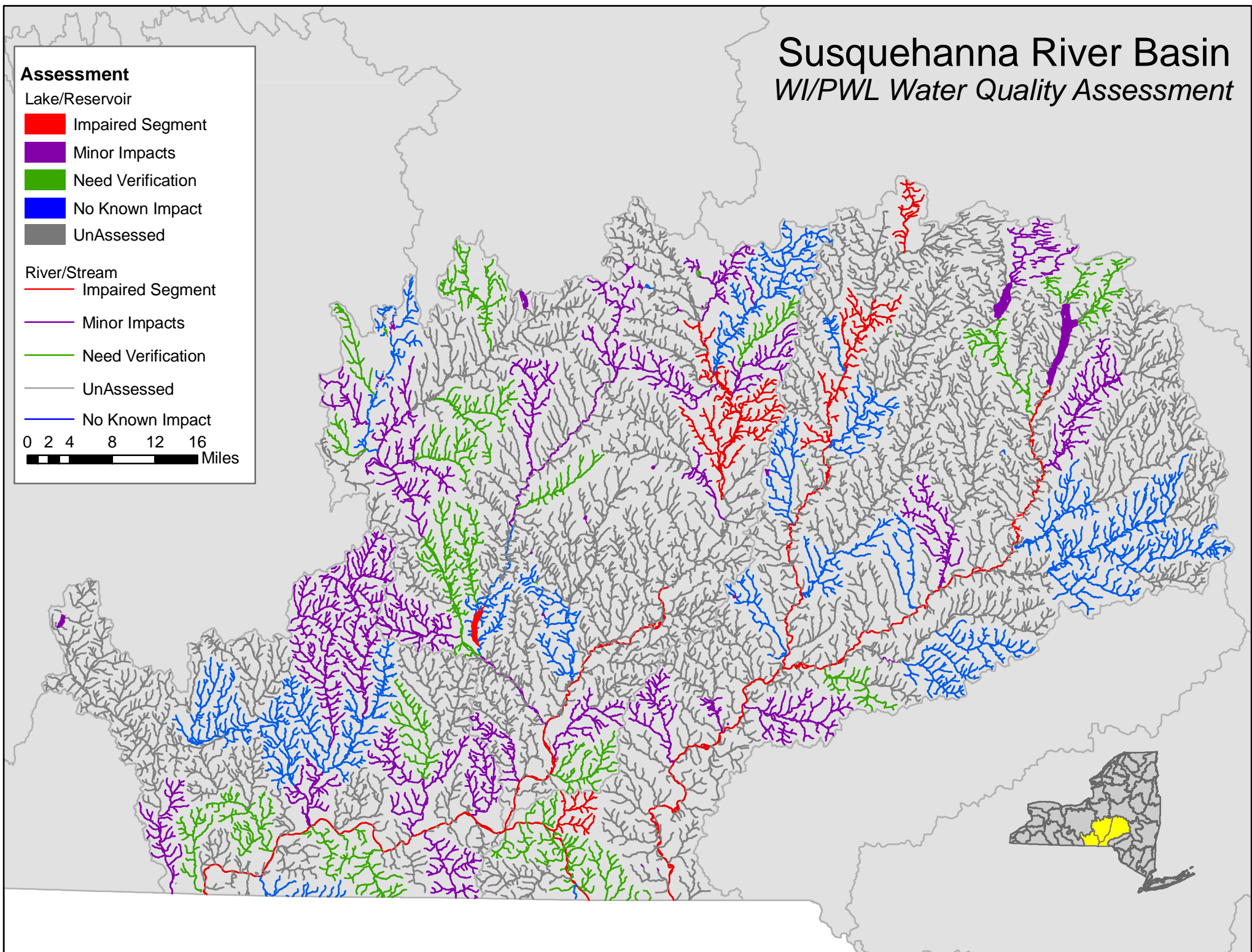
- Impaired Segment
- Minor Impacts
- Need Verification
- No Known Impact
- UnAssessed

River/Stream

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

0 2 4 8 12 16 Miles

Miles



The Susquehanna River Basin

Basin Description

The Susquehanna River Basin is the second largest river basin – next to the Ohio River Basin – east of the Mississippi River and the largest on the Atlantic seaboard. The 444-mile Susquehanna River drains 27,500 square miles covering portions of New York, Pennsylvania and Maryland before emptying into the Chesapeake Bay. In New York State the Susquehanna Basin encompasses much of the south-central portion of the state. The western-most third of the New York State portion of the basin is drained by the Chemung River, which is a major tributary to the Susquehanna. (Within New York State, the Chemung River Basin is considered a separate drainage basin and is addressed in a separate WI/PWL Report.)

Excluding the Chemung River drainage, the Susquehanna River drains approximately 4,520 square miles in central New York. This drainage area includes most of Broome, Chenango, Cortland, Otsego and Tioga Counties; parts of Delaware, Madison and Chemung Counties; and small portions of Schuyler, Tompkins, Onondaga, Oneida, Herkimer and Schoharie Counties.

The population of the entire Susquehanna River Basin totals nearly 4.1 million people (1990); a number that includes about 468,352 New York State residents. The largest population centers within the New York State portion of the basin are Binghamton-Johnson City, Cortland, and Oneonta. The region is characterized by low rolling hills covered by hardwood forests and large wide valleys scattered with agricultural activity. Seventy percent (70%) of the basin is forested; agricultural land uses account for about 25% of the drainage area.

There are about 8,185 miles¹ of rivers and streams and 130 significant² lakes, ponds and reservoirs (covering 16,521 acres) in the New York State portion of the basin. The two largest lakes in the basin – Otsego Lake (4,083 acres) and Whitney Point Reservoir (3,168 acres) – account for over 40% of the total lake acreage.

Water Quality Issues and Problems

Water quality issues within the Susquehanna River Basin emanate primarily from diffuse nonpoint sources of pollution. Streambank erosion and various agricultural activities result in riparian buffer loss and excessive nutrient and sediment loadings to tributary watersheds. Failing and/or inadequate on-site septic systems are cited as significant sources of impacts to lakes and reservoirs, many of which are small, shallow and eutrophic. Flooding, and the impact of flood control efforts on other water uses, are also a concern. The majority of water quality impacts in the basin result in “stressed” or, in the case of drinking water supplies, “threatened” uses. Most of those waters with more severe “impaired” uses are limited by fish consumption advisories, thought to be primarily the result of atmospheric deposition of mercury, or by localized impacts of failing/inadequate on-site systems. These water quality issues are discussed in greater detail below.

Fish Consumption Advisories

Consumption of some species of fish taken from the Susquehanna, Chenango and Unadilla Rivers is restricted by a NYS Department of Health (DOH) health advisory due to mercury contamination. The advisory recommends eating no more than one meal per month of larger walleye (over 22 inches) due to

¹ Stream mileage is from NYSDEC Division of Water 1:24,000 GIS coverage.

² *Significant Lakes* are lakes of 6.4 acres (0.01 square miles) or larger and are included in the New York State Lakes Gazetteer. Total lake area is also calculated from data in the Gazetteer.

mercury contamination. Elevated mercury levels have been documented by NYS DOH as far upstream on the Susquehanna as Bainbridge. Although data for the river above that point are not currently available, the advisory was extended to the entire river as a precaution. The exact source of the contamination is not known; atmospheric deposition is considered a likely contributing source.

Municipal Discharges/Combined Sewer Overflows

Various recreational uses, aesthetics and aquatic life support of the Susquehanna River in the Binghamton-Johnson City-Endicott area are impaired by pathogens, nutrients and ammonia from municipal plant discharges and raw sewage from combined sewer overflows (CSOs). Two major municipal WWTPs – Binghamton-Johnson City Joint Sewage Treatment Plant and Village of Endicott – discharge to the river along this reach. Both are under consent order to upgrade their facilities to address long-standing operational problems as well as about a dozen CSOs, and to reduce nutrient loads. The nutrient removal was initially required in order to protect the fishery and aquatic life from ammonia toxicity. However, efforts by the U.S. Environmental Protection Agency (USEPA) Chesapeake Bay Program to protect the bay by affecting an even greater level of nutrient (nitrogen) reduction have been discussed. Although DEC supports the Chesapeake Bay Program goals, current regulations limit DEC to controlling only ammonia. USEPA has provided the municipalities with \$4.3 million for total nitrogen removal. Plans for improvements to the Endicott WWTP have been approved by DEC. The village is working to secure funding to finance the improvements.

Failing and/or Inadequate On-site Septic Systems

Recreational uses in some portions of the basin are restricted by pathogen contamination and aesthetics (odors, floatables) from failing and/or inadequate on-site septic systems, the result of poor soils and inadequate lot sizes. In these smaller hamlets and villages septic tank effluent is discharged to storm sewers, the ground surface or directly into waterways. In most of these cases the problems are well documented and efforts are underway to develop appropriate collection and conveyance systems. However funding for the construction of these facilities is needed.

Nonpoint Sources of Nutrients, Sediment and Siltation

Nonpoint source loadings of nutrients and silt/sediment to various tributary watersheds in the basin stress aquatic life support and various recreational uses. Streambank erosion is exacerbated by the loss of riparian vegetation buffers along the tributaries. Poor farming practices (barnyard runoff, manure spreading, livestock access to streams) in some portions of this agricultural basin also contribute to thermal stress and other water quality problems.

Excessive Aquatic Weed Growth

Recreational uses (swimming, fishing, boating) and aesthetics in the primarily small, shallow lakes of the basin are restricted by high nutrient loads and resulting algal blooms and high suspended solids. The algal blooms limit dissolved oxygen which impacts fish/aquatic life. Various nonpoint sources, such as agricultural activity, streambank erosion, failing and/or inadequate on-site septic systems and residential development and construction contribute nutrients and sediments which exacerbate eutrophic conditions in the basin lakes.

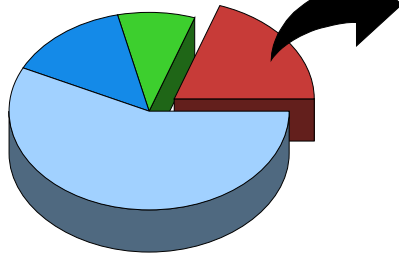
Flooding Issues

History has shown the Susquehanna River Basin to be one of the most flood-prone regions in the nation, experiencing major flooding damage on the average of once every twenty years. Higher gradient streams in

the lower basin and highly erodible soils result in frequent flash flooding and excessive streambank erosion. In addition to flooding impacts, the effects of flood control efforts (which result in fluctuating water levels and the capture of silt/sediment loads) can conflict with and limit aquatic life support and recreational uses in some reservoirs.

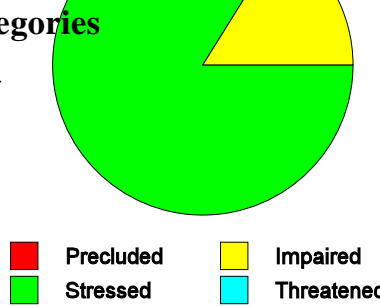
Rivers/Streams

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



- Priority Waterbody Segments
- Segments Needing Verification
- Waters with No Known Impacts
- UnAssessed Water

Severity of Problems (PWL Segments only)

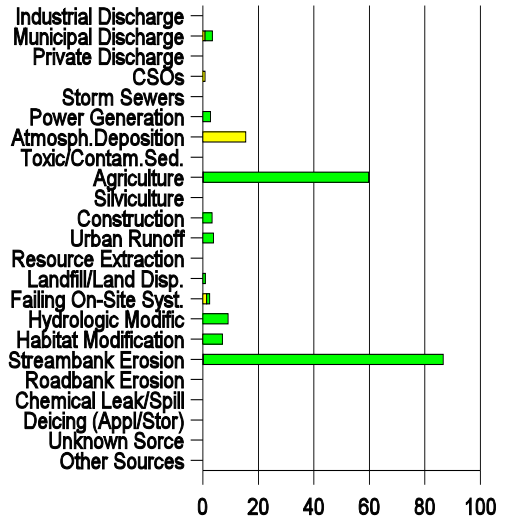


- Precluded
- Stressed
- Impaired
- Threatened

Susquehanna River Basin

Total River Miles: 4,883
Total PWL Miles: 1,633

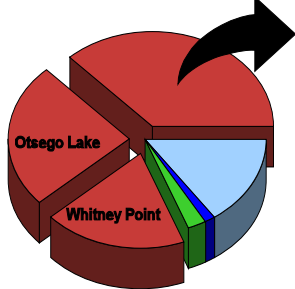
Major Sources to Priority Waterbodies



Percent of PWL Waters Affected

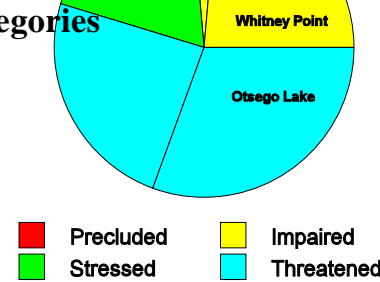
Lakes/Reservoirs

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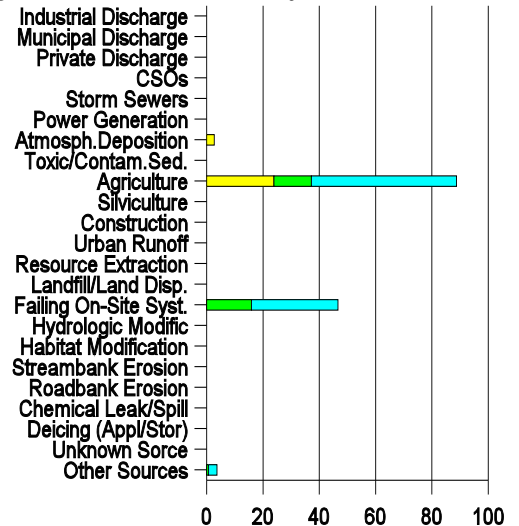


- Precluded
- Stressed
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Susquehanna River Basin

Total Lake Acres: 16,521
Total PWL Acres: 13,378

Major Sources to Priority Waterbodies



Percent of PWL Waters Affected

Basin Water Quality Summary

About 33% of the river/stream miles in the Susquehanna River Basin (1,633 miles) are listed on the Priority Waterbodies List. Over 83% of these miles are listed as *Stressed* waters that fully support appropriate uses.

Only about 16% of basin river miles are *Impaired* (none are *Precluded*) and frequently do not support appropriate uses.

A larger percentage (about 81%) of lake acres in the basin are listed on the PWL. This percentage includes the two largest lakes in the basin: Otsego Lake and Whitney Point Reservoir. Otsego Lake is listed as a *Threatened* water that continues to support a wide range of uses, but where signs of declining water quality have been recorded. This 4,083 acre lake accounts for about 30% of the lake acres listed on the PWL. Impacts to 3,168 acre Whitney Point Reservoir account for another 23% of listed waters and nearly 90% of the lake acres listed as *Impaired*. The relative contributions of these two lakes are shown in the charts.

Atmospheric deposition and agricultural activities are the primary sources of the most significant use impairments. Streambank erosion, agricultural activities and failing on-site septic systems are the most frequently cited sources contributing to water quality impacts basinwide. In the more populated and developed areas of the basin, municipal discharges, urban runoff and construction activities appear as major sources of pollutants.