



The Susquehanna River Basin Commission (SRBC) established the Interstate Streams Monitoring Program in 1986 to collect data that were not available from monitoring programs implemented by state agencies in New York, Pennsylvania, and Maryland. The primary purpose of the program is to collect water quality data, assess biological conditions, and rate physical habitat at the more than 80 streams that cross state lines in the Susquehanna River Basin.

The water quality data collected in the Interstate Streams Program are used in a variety of ways, including assessing streams for compliance with state water quality standards, characterizing stream quality and seasonal variations, providing information to signatory states for 303(d) listing and possible Total Maximum Daily Load (TMDL) development, and identifying areas for restoration and protection. Biological conditions are assessed using benthic macroinvertebrate populations, which provide an indication of the biological health of a stream and serve as indicators of water quality. Habitat assessments provide information concerning potential stream impairment from erosion and sedimentation, as well as an indication of the stream's ability to support a healthy biological community.

SRBC monitors and submits an annual report on the water quality and biological conditions of more than 50 locations on these interstate streams (Figure 1).

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# Assessment of Interstate Streams in the Susquehanna River Basin

July 1, 2005 - June 30, 2006

## Summary Report

[www.srbc.net/interstate\\_streams](http://www.srbc.net/interstate_streams)

Starting in 2007, SRBC converted the Interstate Streams Monitoring Program report to a web-based format to make the data on these streams more easily accessible to government agencies and the general public. This summary is a companion publication to the web-based report of the findings for fiscal year 2006. The full report can be found online at [www.srbc.net/interstate\\_streams](http://www.srbc.net/interstate_streams).



*Susquehanna River at Windsor, N.Y.*

## Methods

Interstate streams are divided into three groups based on the degree of water quality impairment, historical water quality impacts, and potential for degradation (Table 1). Stream discharge data were obtained from U.S. Geological Survey (USGS) gages or were measured instream, unless high streamflows made access impossible. Depth-integrated water samples were collected at each of the sites, and nutrient and metal concentrations were analyzed at the Pennsylvania Department of Environmental Protection Bureau of Laboratories.

Benthic macroinvertebrates were collected from Group 1 and 2 stations from August 1-29, 2005, and from Group 3 stations May 23-25, 2006, using Rapid Bioassessment Protocol III protocols.

Macroinvertebrate data analysis were based on an evaluation of seven metrics, which included: taxonomic richness, Shannon Diversity Index, Modified Hilsenhoff Biotic Index, Ephemeroptera, Plecoptera, Trichoptera (EPT) Index, percent Ephemeroptera, percent dominant taxa, and percent Chironomidae. Eleven habitat parameters were evaluated at all stations where a macroinvertebrate sample was collected. These parameters include epifaunal substrate, instream cover, embeddedness, velocity/depth regimes, sediment deposition, channel flow status, channel alteration, frequency of riffles, condition of banks, vegetative protective cover, and riparian vegetative zone width. Results of laboratory analyses for chemical parameters were compared to state water quality standards. In addition, a simple water quality index (WQI) was calculated and values that exceeded the 90th percentile for each grouping were noted.

Table 1. Explanation of Sites

Stream Group	Potential for Impacts	Sampling Frequency
Group 1	Highest	Quarterly water quality, annual biology and habitat assessment
Group 2	Moderate	Annual water quality, biology, and habitat assessment
Group 3	Low	Annual field chemistry, biology, and habitat assessment

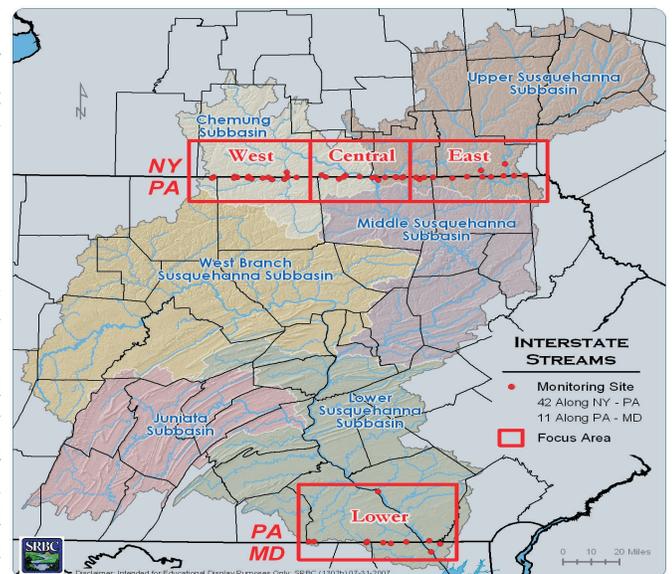


Figure 1. Locations of Interstate Stream Sampling Sites

## Results and Conclusions

Water quality in 20 percent of the Group 1 and Group 2 streams continued to meet designated classes and water quality standards. Of the 607 possible total observations, 86 exceeded water quality standards. Twenty-two out of the 28 sites had parameters exceeding water standards, with 17 of those having more than one violation.

The parameter that most frequently exceeded water quality standards was total aluminum (Figure 2). Aluminum exceeded New York water quality standards (100 µg/l) in every sample for the New York-Pennsylvania border streams. Total iron and total aluminum appear to be naturally high in some of these watersheds but still exceed New York water quality standards. Tioga River is the only stream that has documented abandoned mine discharge indicated by high metals and high acidity.

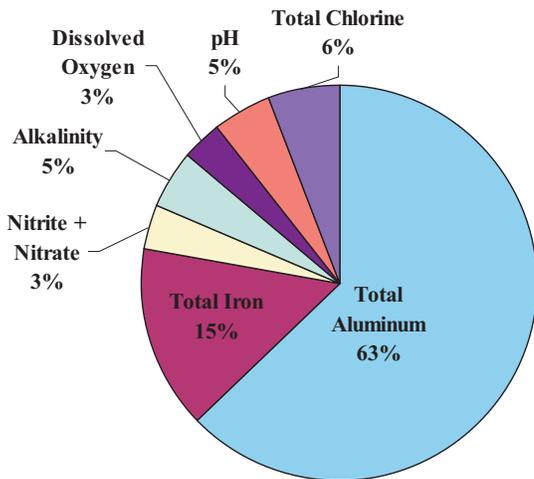


Figure 2. Parameters Exceeding Water Quality Standards

The Pennsylvania-Maryland border streams are located in a heavily agricultural region, and nutrients exceeded standards at many of these sites. Water quality at the large river sites appeared to decline slightly with an increased number of state water quality standard violations. Overall, during this sampling period, a large number of streams had water quality parameters that exceeded standards.

Biological conditions at 19 of the 44 sampling sites were designated as nonimpaired, 16 sites were slightly impaired, and the remaining 9 sites were moderately impaired (Figure 3). This is a slight decline from last year when more streams were nonimpaired and fewer were moderately impaired. Eight streams showed an improvement in biological conditions from last year, and ten sites showed a decline in biological conditions from last year. The biological conditions at Seeley Creek, Cowanesque River 1.0 and 2.2, Babcock Run, Bill Hess Creek, Denton Creek, Dry Brook, White Branch Cowanesque River, and Long Arm Creek were designated as moderately impaired.

The most common reasons for low biological metric scores at these sites were high percentages and dominance of Chironomidae in the sample and low EPT Index. Denton Creek, White Branch Cowanesque River, and Cowanesque

River 2.2 were moderately impaired for the second consecutive year. Physical causes of these biological impairments may include upstream impoundments, agriculture, urban impacts, and channelization. Nine sites (SUSQ 10.0, SUSQ 44.5, CASC 1.6, TROW 1.8, LSNK 7.6, WAPP 2.6, HLDN 3.5, NFCR 7.6, SCTT 3.0) were not sampled for macroinvertebrates or habitat due to either dry conditions or deep waters.

Habitat condition at 21 (48 percent) of the sampling sites was rated as excellent. Twenty-two sites (50 percent) had supporting habitats, and only one site (2 percent) was designated as having a partially supporting habitat. Fourteen sampling sites showed improved habitat conditions, and four sites showed some degradation in habitat conditions over the past year. The most common habitat concerns throughout all the interstate stream sites were lack of riparian vegetative zones, sediment deposition, and erosion of stream banks.

Reference sites were those sites that had the best combination of water quality, biological conditions, and physical habitat. The reference sites for this year were South Creek for the New York-Pennsylvania streams, Big Branch Deer Creek for the Pennsylvania-Maryland streams, Deep

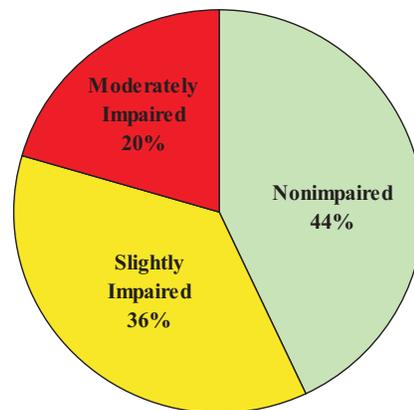


Figure 3. Summary of Biological Assessments

Hollow Brook for the Group 3 streams, and the Susquehanna River 365 site at Windsor, N.Y., for the large river sites.

The current and historical data collected for the interstate streams monitoring program provide a database that enables SRBC staff and others to better manage water quality, water quantity, and biological resources of interstate streams in the Susquehanna River Basin. The data can be used by SRBC's member states and local interest groups to gain a better understanding of water quality in upstream and downstream areas outside of their jurisdiction. Information collected also can serve as a starting point for more detailed assessments and remediation efforts that may be planned on these streams. Data for these interstate stream sites, both current and historical, are available by contacting SRBC. SRBC's interstate monitoring program is funded, in part, through a grant from the U.S. Environmental Protection Agency.