



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 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 SRBC's member 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). Reports and summaries for previous years are also available at <http://www.srbc.net/pubinfo/techdocs/Publications/techreports.htm>.

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Assessment of Interstate Streams in the Susquehanna River Basin

July 1, 2006 - June 30, 2007

Summary Report

www.srbc.net/interstate_streams

SRBC uses a web-based reporting format to make the Interstate Streams data easily accessible to government agencies and the general public. This document is a companion publication for the FY-07 web-based report and summarizes all its findings. The full web-based report with details for all sampling sites can be found at www.srbc.net/interstate_streams.



Susquehanna River at Conklin, N.Y.

Methods

The 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 stream flows 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 at Group 1 and 2 stations between July 24 and August 24, 2006, and at Group 3 stations between May 22 and June 4, 2007, using Rapid Bioassessment Protocol III methods. Macroinvertebrate data analysis was 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 physical habitat parameters were evaluated at all stations where a macroinvertebrate sample was collected. These parameters include epifaunal substrate, instream cover, embeddedness, velocity and depth regimes, sediment deposition, channel flow status, channel alteration, frequency of riffles, condition of banks, vegetative protective cover, and riparian vegetative zone width.

Table 1. Explanation of Sites

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

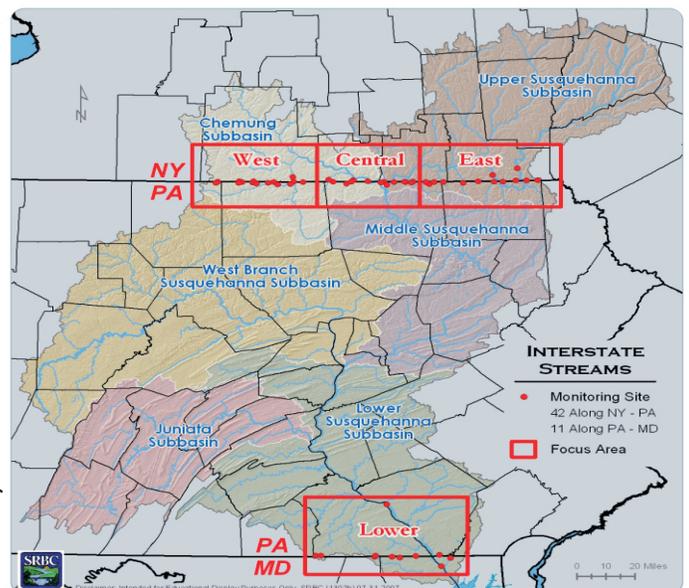


Figure 1. Locations of Interstate Stream Sampling Sites

(over)

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.

Results and Conclusions

Water quality in 30 percent of the Group 1 and Group 2 streams continued to meet designated classes and water quality standards during FY-07. This is an improvement from last year. Of the 733 possible total observations, 69 exceeded water quality standards. Twenty out of the 29 sites had parameters exceeding water standards, with 13 of those having

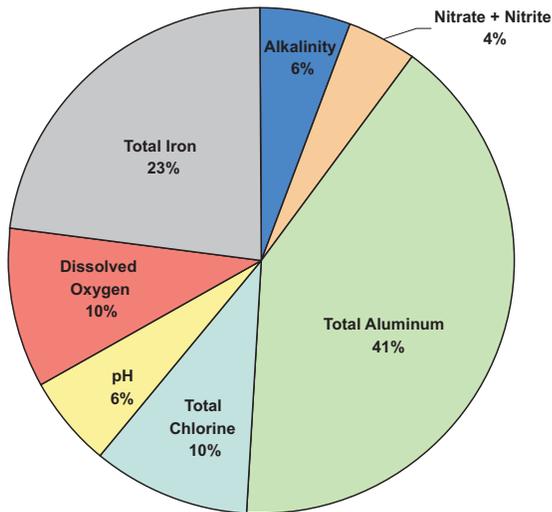


Figure 2. Parameters Exceeding Water Quality Standards

more than one violation. The parameter that most frequently exceeded water quality standards was total aluminum (Figure 2), although there are less aluminum violations than there were last year. 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. The Pennsylvania-Maryland border streams are located in a heavily agricultural region, and nutrient concentrations were high at many of these sites. Water quality at the large river sites appeared to decline slightly again this year 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. These streams included Apalachin Creek, Bentley Creek, Cascade Creek, Cayuta Creek, Choconut Creek, North Fork Cowanesque River, Seeley Creek, Snake Creek, South Creek, Troups Creek, Conowingo Creek, Ebaughs Creek, Scott Creek, Chemung River, Cowanesque River (1.0 and 2.2), Susquehanna River (10.0, 44.5, 289.1, 340, and 365), Tioga River, Deep Hollow Brook, and Denton Creek.

Biological conditions at 14 of the 48 sampling sites were designated as nonimpaired, 22 sites were slightly impaired, and ten sites were moderately impaired. The remaining two sites were ranked severely impaired (Figure 3). This is a slight overall decline from last year, as there were no streams designated as severely impaired as well as a greater number of nonimpaired streams in FY-06. Eight streams showed an improvement in biological conditions from last year, and 14 sites showed a decline in biological conditions from last year. The biological conditions at Bill Hess Creek, Bulkley

Brook, Conowingo Creek, Cowanesque River 1.0 and 2.2, Denton Creek, Holden Creek, Prince Hollow Run, Seeley Creek, and Wappasening Creek were designated as moderately impaired. White Branch Cowanesque River and Dry Brook were designated as having severely impaired biological conditions. 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. Physical causes of these biological impairments may include upstream impoundments, agriculture, urban impacts, and channelization. Five sites (SUSQ 10.0, SUSQ 44.5, TROW 1.8, SNAK 2.3, and LWAP) were not sampled for macroinvertebrates or habitat due to either dry conditions or deep waters.

Habitat conditions at 22 (46 percent) of the sampling sites were rated as excellent. Nineteen sites (40 percent) had supporting habitats, and seven sites (14 percent) were designated as having a partially supporting habitat. Six sampling sites showed improved habitat conditions, and 12 sites showed some degradation in habitat conditions over the past year. The most common habitat concerns throughout all the interstate stream sites continue to be 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 Cayuta Creek for the New York-Pennsylvania streams, Deer Creek for the Pennsylvania-Maryland streams, Deep Hollow Brook for the Group 3 streams, and the Susquehanna River 340 site at Kirkwood, N.Y., for the large river sites.

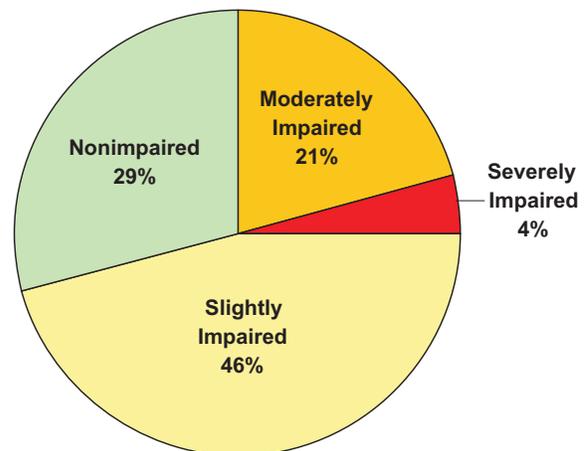


Figure 3. Summary of Biological Assessments

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. SRBC's interstate monitoring program is funded, in part, through a grant from the U.S. Environmental Protection Agency.