

---

# **ASSESSMENT OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN**

Monitoring Report No. 17  
July 1, 2002, Through June 30, 2003

*Publication 233*

*July 30, 2004*

---

*Prepared by*  
*Susan R. LeFevre*  
*Biologist*

*Darryl L. Sitlinger*  
*Water Quality Technician*

*Watershed Assessment and Protection Program*  
*Susquehanna River Basin Commission*



Printed on recycled paper

# SUSQUEHANNA RIVER BASIN COMMISSION



Paul O. Swartz, Executive Director

Erin M. Crotty, N.Y. Commissioner  
Kenneth P. Lynch, N.Y. Alternate  
Scott J. Foti, N.Y. Alternate/Advisor

Kathleen A. McGinty, Pa. Commissioner  
Cathleen C. Myers, Pa. Alternate  
William A. Gast, Pa. Alternate/Advisor

Kendl Philbrick, Md. Commissioner  
Dr. Robert M. Summers, Md. Alternate  
Matthew G. Pajerowski, Md. Alternate/Advisor

Brigadier General Merdith W. B. Temple, U.S. Commissioner  
Colonel Robert J. Davis, Jr., U.S. Alternate  
Stacey E. Brown, U.S. Advisor

The Susquehanna River Basin Commission was created as an independent agency by a federal-interstate compact\* among the states of Maryland, New York, Commonwealth of Pennsylvania, and the federal government. In creating the Commission, the Congress and state legislatures formally recognized the water resources of the Susquehanna River Basin as a regional asset vested with local, state, and national interests for which all the parties share responsibility. As the single federal-interstate water resources agency with basinwide authority, the Commission's goal is to coordinate the planning, conservation, management, utilization, development and control of basin water resources among the public and private sectors.

\*Statutory Citations: *Federal - Pub. L. 91-575, 84 Stat. 1509 (December 1970); Maryland - Natural Resources Sec. 8-301 (Michie 1974); New York - ECL Sec. 21-1301 (McKinney 1973); and Pennsylvania - 32 P.S. 820.1 (Supp. 1976).*

## TABLE OF CONTENTS

ABSTRACT .....	1
INTRODUCTION .....	1
BASIN GEOGRAPHY .....	2
METHODS .....	2
Field and Laboratory Methods .....	2
Sampling frequency.....	2
Stream discharge .....	2
Water samples .....	4
Field chemistry.....	4
Macroinvertebrate and physical habitat sampling.....	12
Data Synthesis Methods .....	13
Chemical water quality.....	13
Reference category designations .....	13
Biological and physical habitat conditions.....	17
Trend analysis .....	17
RESULTS .....	17
Water Quality .....	17
Biological Communities and Physical Habitat .....	23
New York-Pennsylvania streams .....	23
Pennsylvania-Maryland streams .....	23
River sites.....	23
Group 3 sites .....	23
BIOASSESSMENT OF INTERSTATE STREAMS.....	38
New York-Pennsylvania Border Streams .....	38
Apalachin Creek (APAL 6.9).....	38
Bentley Creek (BNTY 0.9) .....	38
Cascade Creek (CASC 1.6).....	38
Cayuta Creek (CAYT 1.7) .....	38
Choconut Creek (CHOC 9.1) .....	39
Holden Creek (HLDN 3.5).....	45
Little Snake Creek (LSNK 7.6).....	45
North Fork Cowanesque River (NFCR 7.6).....	45
Seeley Creek (SEEL 10.3) .....	45
Snake Creek (SNAK 2.3).....	50
South Creek (SOUT 7.8).....	50
Troups Creek (TRUP 4.5).....	50
Trowbridge Creek (TROW 1.8).....	50
Wappasening Creek (WAPP 2.6).....	50

Pennsylvania-Maryland Streams .....	51
Big Branch Deer Creek (BBDC 4.1).....	51
Conowingo Creek (CNWG 4.4).....	51
Deer Creek (DEER 44.2) .....	51
Ebaughs Creek (EBAU 1.5) .....	51
Falling Branch Deer Creek (FBDC 4.1).....	61
Long Arm Creek (LNGA 2.5).....	61
Octoraro Creek (OCTO 6.6).....	61
Scott Creek (SCTT 3.0).....	61
South Branch Conewago Creek (SBCC 20.4).....	61
River Sites .....	67
Chemung River (CHEM 12.0) .....	67
Cowanesque River (COWN 2.2).....	67
Cowanesque River (COWN 1.0).....	67
Susquehanna River at Windsor, N.Y. (SUSQ 365.0).....	71
Susquehanna River at Kirkwood, N.Y. (SUSQ 340.0) .....	71
Susquehanna River at Sayre, Pa. (SUSQ 289.1) .....	71
Susquehanna River at Marietta, Pa. (SUSQ 44.5).....	71
Susquehanna River at Conowingo, Md. (SUSQ 10.0) .....	75
Tioga River (TIOG 10.8) .....	75
Group 3 Sites .....	79
Babcock Run (BABC).....	79
Beagle Hollow Run (BEAG).....	79
Bill Hess Creek (BILL).....	79
Bird Creek (BIRD) .....	79
Biscuit Hollow (BISC).....	79
Briggs Hollow Run (BRIG) .....	79
Bulkley Brook (BULK).....	79
Camp Brook (CAMP) .....	80
Cook Hollow (COOK) .....	80
Deep Hollow Brook (DEEP).....	80
Denton Creek (DENT) .....	80
Dry Brook (DRYB).....	80
Little Wappasening Creek (LWAP).....	80
Parks Creek (PARK) .....	81
Prince Hollow Run (PRIN) .....	81
Russell Run (RUSS).....	81
Sackett Creek (SACK) .....	81
Smith Creek (SMIT).....	81
Strait Creek (STRA).....	82
White Branch Cowanesque River (WBCO).....	82
White Hollow (WHIT) .....	82
MANAGEMENT IMPLICATIONS.....	82

New York – Pennsylvania Sites .....	82
Pennsylvania – Maryland Sites.....	83
River Sites .....	83
Group 3 Streams .....	83
Future Study .....	83
 CONCLUSIONS.....	84
REFERENCES .....	87

## TABLES

Table 1. Interstate Streams in the Susquehanna River Basin .....	3
Table 2. Stream Stations Sampled Along the New York–Pennsylvania Border and Sampling Rationale .....	5
Table 3. Stream Stations Sampled Along the Pennsylvania–Maryland Border and Sampling Rationale .....	7
Table 4. Monitored Parameters .....	12
Table 5. Criteria Used to Evaluate Physical Habitat.....	14
Table 6. Summary of Metrics Used to Evaluate the Overall Biological Integrity of Stream and River Benthic Macroinvertebrate Communities .....	18
Table 7. Summary of Criteria Used to Classify the Biological Conditions of Sample Sites .....	19
Table 8. Summary of Criteria Used to Classify the Habitat Conditions of Sample Sites .....	20
Table 9. Stream Classifications.....	21
Table 10. Water Quality Standard Summary .....	22
Table 11. Summary of New York-Pennsylvania Border RBP III Biological Data.....	24
Table 12. Summary of Pennsylvania-Maryland Border RBP III Biological Data .....	25
Table 13. Summary of River RBP III Biological Data .....	26
Table 14. Summary of Group 3 Sites RBP III Biological Data .....	27
Table 15. Summary of New York-Pennsylvania Sites Physical Habitat Data .....	29
Table 16. Summary of Pennsylvania-Maryland Sites Physical Habitat Data .....	30
Table 17. Summary of River Sites Physical Habitat Data .....	31
Table 18. Summary of Group 3 Sites Physical Habitat Data .....	32
Table 19. Abbreviations Used in Tables 20 Through 51 .....	39
Table 20. Water Quality Summary Apalachin Creek at Little Meadows, Pa.....	40
Table 21. Water Quality Summary Bentley Creek at Wellsburg, N.Y. ....	41
Table 22. Water Quality Summary Cascade Creek at Lanesboro, Pa.....	42
Table 23. Water Quality Summary Cayuta Creek at Waverly, N.Y. ....	43
Table 24. Water Quality Summary Choconut Creek at Vestal Center, N.Y.....	44
Table 25. Water Quality Summary Holden Creek at Woodhull, N.Y.....	46
Table 26. Water Quality Summary Little Snake Creek at Brackney, Pa. ....	47
Table 27. Water Quality Summary North Fork Cowanesque River at North Fork, Pa.....	48
Table 28. Water Quality Summary Seeley Creek at Seeley Creek, N.Y.....	49
Table 29. Water Quality Summary Snake Creek at Brookdale, Pa.....	52

Table 30.	Water Quality Summary South Creek at Fassett, Pa.....	53
Table 31.	Water Quality Summary Troups Creek at Austinburg, Pa.....	54
Table 32.	Water Quality Summary Trowbridge Creek at Great Bend, Pa. ....	55
Table 33.	Water Quality Summary Wappasening Creek at Nichols, N.Y. ....	56
Table 34.	Water Quality Summary Big Branch Deer Creek at Fawn Grove, Pa. ....	57
Table 35.	Water Quality Summary Conowingo Creek at Pleasant Grove, Pa. ....	58
Table 36.	Water Quality Summary Deer Creek at Gorsuch Mills, Md. ....	59
Table 37.	Water Quality Summary Ebaughs Creek at Stewartstown, Pa.....	60
Table 38	Water Quality Summary Falling Branch Deer Creek at Fawn Grove, Pa. ....	62
Table 39.	Water Quality Summary Long Arm Creek at Bandanna, Pa. ....	63
Table 40.	Water Quality Summary Octoraro Creek at Rising Sun, Md.....	64
Table 41.	Water Quality Summary Scott Creek at Delta, Pa. ....	65
Table 42.	Water Quality Summary South Branch Conewago Creek at Bandanna, Pa. ....	66
Table 43.	Water Quality Summary Chemung River at Chemung, N.Y. ....	68
Table 44.	Water Quality Summary Cowanesque River (COWN 2.2) at Lawrenceville, Pa.....	69
Table 45.	Water Quality Summary Cowanesque River (COWN 1.0) at Lawrenceville, Pa.....	70
Table 46.	Water Quality Summary Susquehanna River (SUSQ 365.0) at Windsor, N.Y. ....	72
Table 47.	Water Quality Summary Susquehanna River (SUSQ 340.0) at Kirkwood, N.Y. ....	73
Table 48.	Water Quality Summary Susquehanna River (SUSQ 289.1) at Sayre, Pa.....	74
Table 49.	Water Quality Summary Susquehanna River (SUSQ 44.5) at Marietta, Pa. ....	76
Table 50.	Water Quality Summary Susquehanna River (SUSQ 10.0) at Conowingo, Md.....	77
Table 51.	Water Quality Summary Tioga River at Lindley, N.Y. ....	78

## FIGURES

Figure 1.	Interstate Streams Along the New York-Pennsylvania Border Between Russell Run and Deep Hollow Brook .....	8
Figure 2.	Interstate Streams Along the New York-Pennsylvania Border Between Seeley Creek and Briggs Hollow .....	9
Figure 3.	Interstate Streams Along the New York-Pennsylvania Border Between White Branch Cowanesque River and Smith Creek.....	10
Figure 4.	Interstate Streams Along the Pennsylvania-Maryland Border.....	11
Figure 5.	Parameters Exceeding Water Quality Standards.....	22
Figure 6.	Summary of New York-Pennsylvania Border Streams Habitat and Biological Condition Scores .....	34
Figure 7.	Summary of Pennsylvania-Maryland Border Streams Habitat and Biological Condition Scores .....	35
Figure 8.	Summary of River Habitat and Biological Condition Scores .....	36
Figure 9.	Summary of Group 3 Streams Habitat and Biological Condition Scores .....	37

## APPENDIXES

Appendix A.	Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania and Pennsylvania-Maryland Borders.....	91
Appendix B.	Organic Pollution-Tolerance and Functional Feeding Group Designations of Benthic Macroinvertebrate Taxa.....	109
Appendix C.	Macroinvertebrate Data for Interstate Streams Crossing the New York-Pennsylvania and Pennsylvania-Maryland Borders.....	115
Appendix D.	Water Classification and Best Usage Regulations.....	135



## **ACKNOWLEDGMENTS**

The authors would like to acknowledge those who made significant contributions to the completion of this project. The Pennsylvania Department of Environmental Protection Bureau of Laboratories, in Harrisburg, Pa., conducted all laboratory analysis of chemical water quality. Jennifer Hoffman and David Heicher supervised the project and reviewed the report. Donna Gavin and Jeff Zimmerman produced all the maps. Doreen McCabe provided proofreading and formatting services, and Susan Obleski provided helpful reviews of this report. Additional thanks go to the U.S. Environmental Protection Agency, which provided funding for this project.

