

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
DELAWARE RIVER BASIN NAWQA PROJECT**

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

NAWQA study units are divided into three groups that are studied intensively on a rotational basis. Three NAWQA studies have been active in the state of Pennsylvania. The Lower Susquehanna (LSUS) study unit conducted intensive sampling from 1993 through 1995 and is currently in a low-intensity phase. The Allegheny and Monongahela River Basins (ALMN) study unit conducted intensive sampling from 1996 through 1998 and is currently in a low-intensity phase. The Delaware River Basin (DELR) study unit started intensive sampling in 1999 and will complete this phase of the study in 2001. It will then enter the low-intensity phase and is scheduled to resume intensive sampling in 2008.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies.

Additional Delaware NAWQA data on bed sediment, fish tissue, and fish community can be found in the special-studies section of this report. A complete list of Delaware NAWQA data, including water-quality results from all synoptic and fixed sampling sites, can be found in 'Water Resources Data, New Jersey, Water Year 2001', Water-Data Report NJ-01-3.

Additional information about the NAWQA Program is available through the world wide web at http://water.er.usgs.gov/nawqa/nawqa_home.html.

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Laboratory Measurements

Samples for biochemical-oxygen demand, fecal coliform and enterococcus bacteria, and hexavalent chromium are analyzed at the New Jersey Department of Health, Public Health and Environmental Laboratories. Samples for nutrients are analyzed at the New Jersey Department of Health or at the U.S. Geological Survey Laboratory in Arvada, Colorado. Sediment samples--parameter codes, 80154, 80157, and 80164--are analyzed in the U.S. Geological Survey Laboratories in Iowa City, Iowa. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colorado. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, A4, and A5. These methods are consistent with ASTM standards and generally follow ISO standards.

Analyses of pesticides in surface-water and ground-water samples (schedule 2001)

Selected water samples from DELR-NAWQA study sites were analyzed for pesticides on schedule 2001 during the 2001 water year. This table lists the pesticides on the schedule, the unit of measure (micrograms per liter, µg/L), the U.S. Geological Survey National Water Information System parameter code, and the reporting level. **Only pesticides measured at or above the minimum reporting level for one or more samples are listed in the water-quality tables.**

SCHEDULE DESCRIPTION.--Pesticides in filtered water extracted on C-18 Solid Phase Extraction (SPE) cartridge and analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).

SAMPLE REQUIREMENTS.--1 liter of water filtered through 0.7-micron glass-fiber depth filter, chilled at 4° C (packed in ice).

CONTAINER REQUIREMENTS.--1 liter baked amber glass bottle (GCC) from NWQL.

PCODE.--The USGS/EPA parameter code.

MRL.--Minimum reporting level.

PCode	Compound Name	MRL (µg/L)	PCode	Compound Name	MRL (µg/L)
82660	2,6-Diethylaniline	0.003	82667	Parathion-methyl	0.006
49260	Acetochlor	0.002	39415	Metolachlor	0.002
46342	Alachlor	0.002	82630	Metribuzin	0.004
34253	alpha-HCH	0.002	82671	Molinate	0.004
39632	Atrazine	0.001	82684	Napropamide	0.003
82673	Benfluralin	0.002	34653	p,p'-DDE	0.006
04028	Butylate	0.002	39542	Parathion	0.004
82680	Carbaryl	0.003	82669	Pebulate	0.004
82674	Carbofuran	0.003	82683	Pendimethalin	0.004
38933	Chlorpyrifos	0.004	82687	cis-Permethrin	0.005
04041	Cyanazine	0.004	82664	Phorate	0.002
82682	Dacthal	0.002	04037	Prometon	0.018
04040	Deethylatrazine	0.002	82676	Propyzamide	0.003
39572	Diazinon	0.002	04024	Propachlor	0.007
39381	Dieldrin	0.001	82679	Propanil	0.004
82677	Disulfoton	0.017	82685	Propargite	0.013
82668	EPTC	0.002	04035	Simazine	0.005
82663	Ethalfuralin	0.004	82670	Tebuthiuron	0.010
82672	Ethoprophos	0.003	82665	Terbacil	0.007
04095	Fonofos	0.003	82675	Terbufos	0.013
39341	Lindane	0.004	04022	Terbutylazine	0.1
82666	Linuron	0.002	82681	Thiobencarb	0.002
39532	Malathion	0.005	82678	Triallate	0.001
82686	Azinphos-methyl	0.001	82661	Trifluralin	0.002

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
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Analyses of volatile organic compounds in surface-water and ground-water samples (schedule 2020/2021)

Selected surface water samples from DELR-NAWQA study sites were analyzed for volatile organic compounds (VOCs) in water year 2001. The National Water Quality Lab (NWQL) created a method for accurate determination of VOCs in water in the nanogram per liter range, schedules 2020/2021. The method described in USGS Open-File Report 97-829 (Connor and others) is similar to USEPA method 524-2 (Mund, 1995) and the method described by Rose and Schroeder (1995). Minor improvements to instrument operating conditions include the following: additional compounds, quantitation ions that are different from those recommended in USEPA Method 524.2 because of interferences from the additional compounds, and a data reporting strategy for measuring detected compounds extrapolated at less than the lowest calibration standard or measured at less than the reporting limit. The minimum reporting limit (MRL) is introduced as a statistically defined reporting limit designed to limit false positives and false negatives to less than 1 percent.

This table lists the volatile organic compounds on the schedule, the unit of measure (micrograms per liter ($\mu\text{g/L}$), the U.S. Geological Survey National Water Information System parameter code, the Union of Pure and Applied Chemistry (IUPAC) compound name, and the National Water Quality Laboratory compound name. Positive detections measured at less than MRL but greater than or equal to the long-term method-detection limit are reported as estimated concentrations (E) to alert the data user to decreased confidence in accurate quantitation. Values for analytes in the 2020/2021 schedules are preceded by an "E" in the following situations:

1. When the calculated concentration is less than the lowest calibration standard. The analyte meets all identification criteria to be positively identified, but the amount detected is below where it can be reliably quantified.
2. If a sample is diluted for any reason. The method reporting level is multiplied by the dilution factor to obtain the adjusted method reporting level. Values below the lowest calibration standard, multiplied by the dilution factor are qualified with an "E". For example, a value of 0.19 in a 1:2 dilution is reported as E0.1.
3. If the set spike has recoveries out of the specified range (60-140%).
4. If the analyte is also detected in the set blank. If the value in the sample is less than five times the blank value and greater than the blank value plus the long term method detection limit, the value is preceded by an "E" to indicate that the analyte is positively identified but not positively quantified because the analyte was also detected in the blank.

Only VOCs detected for one or more samples are listed in the water-quality tables.

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
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SCHEDULE DESCRIPTION.--The sample water is actively purged with helium to extract the volatile organic compounds. The volatile compounds are trapped onto a sorbent trap, thermally desorbed, separated by a megabore gas chromatographic capillary column, and finally determined by a full scan quadropole mass spectrometer. Compound identification is confirmed by the gas chromatographic retention time and by the resultant mass spectrum, typically identified by three unique ions.

SAMPLE REQUIREMENTS.--Water collected in vials (ground water) placed in stainless steel VOC sampler (surface water). Hydrochloric acid is used for preservation. Chilled at 4°C (packed in ice).

CONTAINER REQUIREMENTS.--40 milliliter baked amber septum glass vial, from OCALA Quality Water Service Unit.

PCODE.--The EPA/USGS parameter code.

COMPOUND NAME.--IUPAC nomenclature.

MRL.--Minimum reporting level..

PCode	Compound Name	MRL (µg/L)	PCode	Compound Name	MRL (µg/L)
77041	Carbon disulfide	0.07	32101	Bromodichloromethane	0.048
34506	1,1,1-Trichloroethane	0.032	34668	Dichlorodifluoromethane	0.27
34516	1,1,2,2-Tetrachloroethane	0.09	81577	Diisopropyl ether	0.10
34511	1,1,2-Trichloroethane	0.06	77562	1,1,1,2-Tetrachloroethane	0.030
34496	1,1-Dichloroethane	0.066	34396	Hexachloroethane	0.19
34501	1,1-Dichloroethylene	0.04	81576	Diethyl ether	0.17
77168	1,1-Dichloropropene	0.026	50004	Ethyl tert-butyl ether	0.054
77443	1,2,3-Trichloropropane	0.16	50005	tert-Pentyl methyl ether	0.11
77651	1,2-Dibromoethane	0.036	34371	Ethylbenzene	0.030
32103	1,2-Dichloroethane	0.13	77652	1,1,2-Trichlorotrifluoroethane	0.06
34541	1,2-Dichloropropane	0.068	81607	Tetrahydrofuran	2.2
34546	trans-1,2-Dichloroethylene	0.032	39702	Hexachlorobutadiene	0.14
77170	2,2-Dichloropropane	0.05	50000	1,2,3,5-Tetramethylbenzene	0.20
73547	trans-1,4-Dichloro-2-butene	0.7	73570	Ethyl methacrylate	0.18
77103	2-Hexanone	0.7	81597	Methyl methacrylate	0.35
81552	Acetone	5	81593	Methyl acrylonitrile	0.6
34215	Acrylonitrile	1.2	77297	Bromochloromethane	0.044
77613	1,2,3-Trichlorobenzene	0.27	49991	Methyl acrylate	1.4
77221	1,2,3-Trimethylbenzene	0.12	77424	Methyl iodide	0.12
34551	1,2,4-Trichlorobenzene	0.19	78032	tert-Butyl methyl ether	0.17
77222	1,2,4-Trimethylbenzene	0.056	34413	Bromomethane	0.26
77226	1,3,5-Trimethylbenzene	0.044	34418	Chloromethane	0.5
34566	1,3-Dichlorobenzene	0.054	34423	Dichloromethane	0.38
34571	1,4-Dichlorobenzene	0.050	81595	2-Butanone	1.6
77223	Isopropylbenzene	0.032	78133	4-Methyl-2-pentanone	0.37
77342	Butylbenzene	0.19	85795	m- and p-Xylene	0.06
77224	n-Propylbenzene	0.042	34696	Naphthalene	0.25
34536	1,2-Dichlorobenzene	0.048	77275	2-Chlorotoluene	0.042
77350	sec-Butylbenzene	0.032	77135	o-Xylene	0.038
77353	tert-Butylbenzene	0.06	77356	4-Isopropyl-1-methylbenzene	0.07
34030	Benzene	0.035	49999	1,2,3,4-Tetramethylbenzene	0.23
81555	Bromobenzene	0.036	77173	1,3-Dichloropropane	0.12
50002	Bromoethene	0.10	78109	3-Chloropropene	0.20
32104	Bromoform	0.06	77128	Styrene	0.042
32102	Tetrachloromethane	0.06	34475	Tetrachloroethylene	0.10
34301	Chlorobenzene	0.028	77220	o-Ethyl toluene	0.06
32105	Dibromochloromethane	0.18	77277	4-Chlorotoluene	0.06
34311	Chloroethane	0.12	34010	Toluene	0.05
32106	Chloroform	0.052	34699	trans-1,3-Dichloropropene	0.09
77093	cis-1,2-Dichloroethylene	0.038	39180	Trichloroethylene	0.038
34704	cis-1,3-Dichloropropene	0.09	34488	Trichlorofluoromethane	0.09
82625	1,2-Dibromo-3-chloropropane	0.21	39175	Vinyl chloride	0.11
30217	Dibromomethane	0.050			

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Analyses of pesticides in ground-water samples (schedule 2060)

Ground-water samples from the DELR-NAWQA study sites were analyzed for pesticides on schedule 2060 during the 2001 water year. This table lists the pesticides analyzed for by the schedule, the unit of measure (micrograms per liter, µg/L), the U.S. Geological Survey National Water Information System parameter code, and the reporting level. **Only pesticides measured at or above the minimum reporting level for one or more samples are listed in the water-quality tables.**

SCHEDULE DESCRIPTION.--Determination of pesticides in filtered water by Graphitized Carbon-based Solid Phase Extraction (SPE) and analyzed by High Performance Liquid Chromatography/Mass Spectrometry (HPLC/MS).

SAMPLE REQUIREMENTS.--1 liter of water filtered through 0.7-micron glass-fiber depth filter, chilled at 4° C (packed in ice).

CONTAINER REQUIREMENTS.--1 liter baked amber glass bottle (GCC) from NWQL.

PCODE.--The USGS/EPA parameter code.

COMMON NAME.--Common or trade name(s) for constituent.

MRL.--Minimum reporting level.

PCode	Common Name	MRL (µg/L)	PCode	Compound Name	MRL (µg/L)
39732	2,4-D	0.021	04033	Diphenamid	0.026
50470	2,4-D methyl ester	0.0086	49300	Diuron	0.015
38746	2,4-DB	0.016	49297	Fenuron	0.031
50355	2-Hydroxyatrazine	0.008	61694	Flumetsulam	0.011
61692	3(4-Chlorophenyl)-1-methylurea	0.024	38811	Fluometuron	0.031
49308	3-Hydroxycarbofuran	0.0058	50356	Imazaquin	0.016
50295	3-Ketocarbofuran	1.5	50407	Imazethapyr	0.017
49315	Acifluoren	0.0066	61695	Imidacloprid	0.0068
49312	Aldicarb	0.04	38478	Linuron	0.014
49313	Aldicarb sulfone	0.02	38482	MCPA	0.016
49314	Aldicarb sulfoxide	0.0082	38487	MCPB	0.015
39632	Atrazine	0.009	50359	Metalaxyl	0.02
50299	Bendiocarb	0.025	38501	Methiocarb	0.008
50300	Benomyl	0.0038	49296	Methomyl	0.0044
61693	Bensulfuron-methyl	0.015	61696	Methomyl oxime	0.011
38711	Bentazon	0.011	61697	Metsulfuron-methyl	0.025
04029	Bromacil	0.033	49294	Neburon	0.012
49311	Bromoxynil	0.017	50364	Nicosulfuron	0.013
50305	Caffeine	0.0096	49293	Norflurazon	0.016
49310	Carbaryl	0.028	49292	Oryzalin	0.017
49309	Carbofuran	0.0056	38866	Oxamyl	0.012
61188	Chloramben methyl ester	0.018	50410	Oxamyl oxime	0.013
50306	Chlorimuron-ethyl	0.0096	49291	Picloram	0.019
49306	Chlorothalonil	0.035	49236	Propham	0.0096
49305	Clopyralid	0.013	50471	Propiconazole	0.021
04031	Cycloate	0.013	38538	Propoxur	0.008
49304	Dacthal monoacid	0.011	38548	Siduron	0.016
04040	Deethylatrazine	0.028	50337	Sulfometuron-methyl	0.0088
04039	Deethyldeisopropylatrazine	0.01	82670	Tebuthiuron	0.0062
04038	Deisopropylatrazine	0.044	04032	Terbacil	0.0098
38442	Dicamba	0.012	61159	Tribenuron-methyl	0.0088
49302	Dichloroprop	0.013	49235	Triclopyr	0.022
49301	Dinoseb	0.012			

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Analyses of pesticide metabolites in ground-water samples (schedule LCAA)

Ground-water samples from Delaware River Basin National Water-Quality Assessment Program (DELR NAWQA) study sites were analyzed during the 2001 water year for pesticide metabolites on schedule LCAA (Hostetler and Thurman, 1999).

SCHEDULE DESCRIPTION.--Determination of pesticides metabolite in filtered water analyzed by High Performance Liquid Chromatography-Diode Array Detection and High Performance Liquid Chromatography/Mass Spectrometry.

SAMPLE REQUIREMENTS.--500 milliliter (ml) of water filtered through 0.7-micron glass-fiber depth filter, chilled at 4° C (packed in ice).

CONTAINER REQUIREMENTS.--Four 125 ml baked amber glass bottle (GCC) from Ocala Quality Water Service Unit.

PCODE.--The USGS/EPA parameter code.

MRL.--Minimum reporting level

PCode	Pesticide metabolite (OA, Oxanilic Acid; ESA, Ethanesulfonic Acid)	MRL (µG/L)	Metabolite parent compound (PCode)
61030	Acetochlor OA	0.05	Acetochlor (49260)
61029	Acetochlor ESA	0.05	Acetochlor (49260)
61031	Alachlor OA	0.05	Alachlor (46342)
50009	Alachlor ESA	0.05	Alachlor (46342)
62482	Dimethenamid OA	0.05	Dimethenamid (61588)
61951	Dimethenamid ESA	0.05	Dimethenamid (61588)
62483	Flufenacet OA	0.05	Flufenacet (62481)
61952	Flufenacet ESA	0.05	Flufenacet (62481)
61044	Metolachlor OA	0.05	Metolachlor (39415)
61043	Metolachlor ESA	0.05	Metolachlor (39415)

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FISH COLLECTION RESULTS

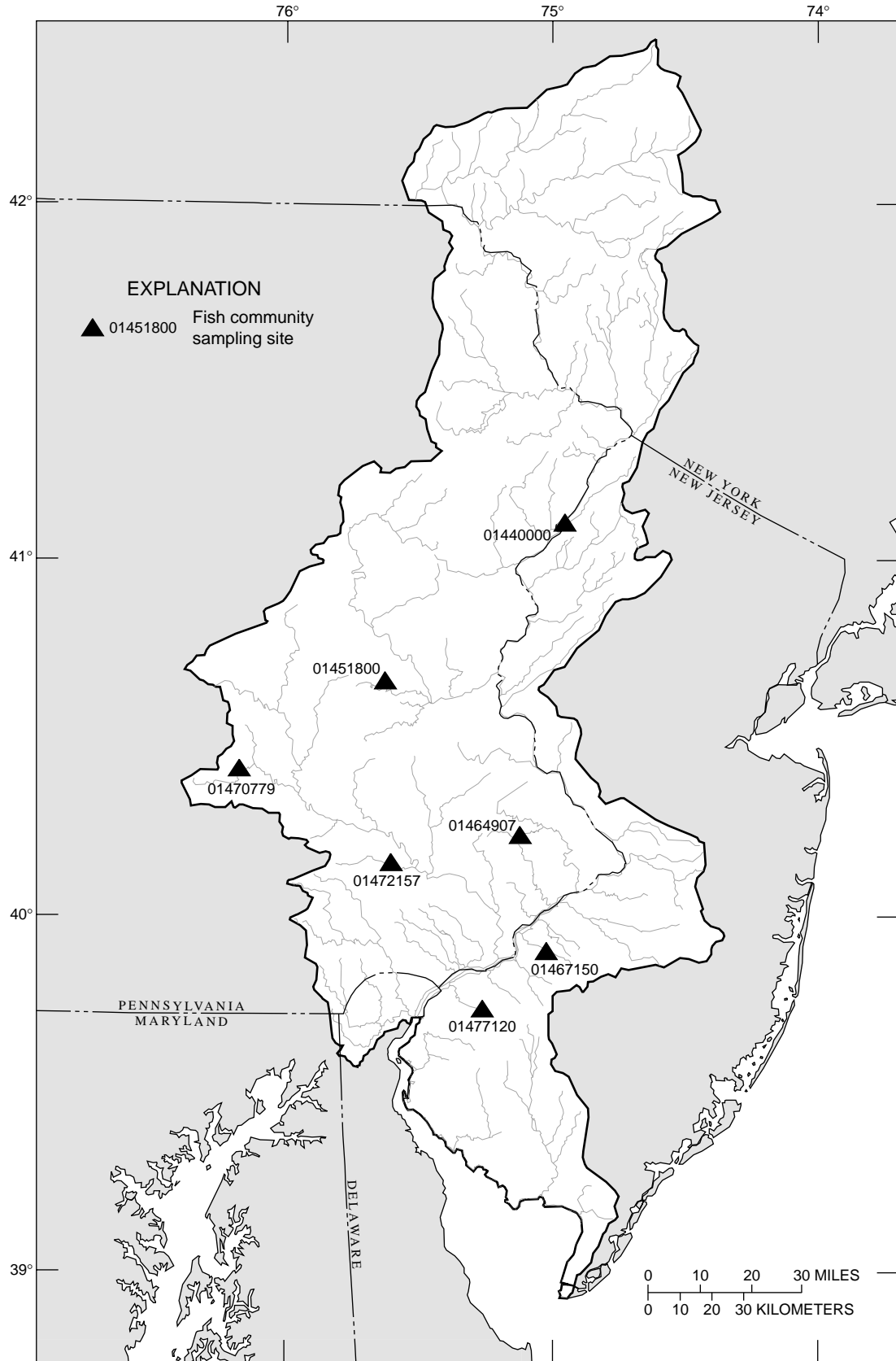


Figure 14.--Location of Delaware River Basin National Water-Quality Assessment Program fish-community sampling sites.

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FISH COLLECTION RESULTS

Fish-community surveys were conducted at 7 stream sites in the Delaware River basin during water year 2001. Sites were located in New Jersey and Pennsylvania. Fish were collected from each site by electrofishing with pulsed-DC current in a representative reach 153 to 310 meters long. One electrofishing pass was conducted at each reach except at station 01467150, at which two passes were conducted. One-quarter inch mesh was used for the dip nets. Fish were identified, measured, weighed, and checked for anomalies such as parasites, lesions, and skeletal deformities. Most individuals were returned to the stream after processing. More details regarding collection methods can be found in Meador and others, 1993, Methods for sampling fish communities as part of the National Water-Quality Assessment program: U.S. Geological Survey Open-File Report 93-104, 40 p. Additional surface-water and/or water-quality data for these sites can be found in the continuous record station section of this report. Family names are in uppercase, scientific names are in italics, and common names follow. Minimum and maximum total lengths (in mm) are in parenthesis below abundance.

List of stations and collection dates

Station ID	Station name	Collection Date
01440000	FLAT BROOK NEAR FLATBROOKVILLE, NJ	07-19-01
01451800	JORDAN CREEK NEAR SCHNECKSVILLE, PA	07-18-01
01464907	LITTLE NESHAMINY C AT VALLEY ROAD NR NESHAMINY, PA	07-24-01
01467150	COOPER RIVER AT HADDONFIELD, NJ	07-11-01
01470779	TULPEHOCKEN CR NR BERNVILLE, PA.	07-17-01
01472157	FRENCH CREEK NEAR PHOENIXVILLE, PA.	07-12-01
01477120	RACCOON CREEK NEAR SWEDESBORO, NJ	07-10-01

Fish species, numbers, minimum and maximum total lengths (in mm), collected during water year 2001

FAMILY	01440000	01451800	01464907	01467150	01470779	01472157	01477120
<i>scientific name</i>							
common name							
PETROMYZONTIDAE							
<i>Lampetra appendix,</i> American brook lamprey	0	0	0	0	0	0	46 (78-177)
<i>Petromyzon marinus,</i> sea lamprey	13 (85-140)	0	0	0	0	0	16 (142-177)
ANGUILLIDAE							
<i>Anguilla rostrata,</i> American eel	170 (40-475)	19 (160-586)	40 (130-570)	51 (108-655)	0	5 (375-860)	41 (111-540)
CLUPEIDAE							
<i>Alosa aestivalis,</i> blueback herring	0	0	0	7 (55-66)	0	0	0
<i>Alosa pseudoharengus,</i> alewife	0	0	0	1 (66)	0	0	1 (47)
CYPRINIDAE							
<i>Cyprinella analostana,</i> satinfin shiner	0	7 (51-83)	29 (43-82)	0	0	9 (30-94)	12 (58-93)
<i>C. spiloptera,</i> spotfin shiner	0	0	42 (48-104)	0	13 (75-102)	0	0
<i>Cyprinus carpio,</i> common carp	0	0	0	2 (324-366)	30 (304-638)	0	0
<i>Exoglossum maxillingua,</i> cutlips minnow	221 (45-115)	348 (55-128)	0	0	37 (49-130)	154 (51-129)	0
<i>Hybognathus regius,</i> eastern silvery minnow	0	0	0	15 (47-140)	0	0	52 (90-137)
<i>Luxilus cornutus,</i> common shiner	0	65 (28-121)	1 (84)	0	2 (70-76)	51 (54-133)	31 (70-106)
<i>Notemigonus crysoleucas,</i> golden shiner	0	0	0	0	0	0	6 (82-112)
<i>Notropis amoenus,</i> comely shiner	0	0	0	0	0	0	0
<i>N. hudsonius,</i> spottail shiner	0	0	24 (47-56)	153 (31-111)	29 (35-104)	4 (75-102)	69 (67-127)
<i>N. procne,</i> swallowtail shiner	0	0	166 (46-75)	0	0	4 (50-66)	11 (45-68)
<i>Pimephales notatus,</i> bluntnose minnow	0	62 (47-73)	0	0	11 (57-82)	0	0
<i>P. promelas,</i> fathead minnow	0	0	0	0	1 (73)	0	0
<i>Rhinichthys atratulus,</i> blacknose dace	889 (29-79)	520 (30-73)	3 (40-47)	0	144 (36-86)	85 (50-67)	0
<i>R. cataractae,</i> longnose dace	106 (56-115)	331 (40-101)	0	0	74 (55-115)	67 (32-118)	0

FAMILY	01440000	01451800	01464907	01467150	01470779	01472157	01477120
scientific name							
common name							
<i>Semotilus atromaculatus</i> , creek chub	0	2 (32-32)	0	0	1 (78)	1 (76)	0
<i>Semotilus corporalis</i> , fallfish	3 (41-47)	0	0	2 (50-50)	2 (71-72)	89 (37-290)	46 (80-253)
CATOSTOMIDAE							
<i>Catostomus commersoni</i> , white sucker	97 (29-51)	551 (30-355)	256 (52-300)	59 (44-314)	245 (40-385)	94 (35-341)	82 (37-363)
<i>Erimyzon oblongus</i> , creek chubsucker	0	0	0	0	0	0	0
<i>Hypentelium nigricans</i> , northern hog sucker	7 (72-92)	0	0	0	0	0	0
ICTALURIDAE							
<i>Ameiurus catus</i> , white catfish	0	0	0	0	0	0	0
<i>A. natalis</i> , yellow bullhead	0	0	21 (117-260)	0	0	3 (149-171)	0
<i>A. nebulosus</i> , brown bullhead	0	0	1 (83)	1 (39)	0	3 (134-162)	0
<i>Ictalurus punctatus</i> , channel catfish	0	0	0	0	0	0	0
<i>Noturus insignis</i> , marginated madtom	11 (65-118)	181 (55-140)	0	0	0	13 (72-135)	0
ESOCIDAE							
<i>Esox americanus</i> , redfin pickerel	0	1 (155)	1 (88)	0	0	0	3 (77-121)
<i>Esox niger</i> , chain pickerel	0	0	0	1 (120)	0	0	0
UMBRIDAE							
<i>Umbra pygmaea</i> , eastern mudminnow	0	0	0	0	0	0	8 (45-74)
SALMONIDAE							
<i>Oncorhynchus mykiss</i> , rainbow trout	0	5 (288-373)	0	0	0	7 (227-280)	0
<i>Salmo trutta</i> , brown trout	1 (74)	4 (181-221)	0	0	3 (274-335)	51 (212-299)	0
APHREDODERIDAE							
<i>Aphredoderus sayanus</i> , pirate perch	0	0	0	0	0	0	2 (71-74)
CYPRINODONTIDAE							
<i>Fundulus diaphanus</i> , banded killifish	0	11 (56-82)	48 (55-101)	0	0	0	0
PERCICHTHYIDAE							
<i>Morone americana</i> , white perch	0	0	0	12 (105-186)	0	0	1 (166)
<i>Morone saxatilis</i> , striped bass	0	0	0	0	0	0	2 (178-244)
CENTRARCHIDAE							
<i>Ambloplites rupestris</i> , rock bass	0	45 (60-168)	40 (76-195)	0	17 (103-183)	140 (46-192)	0
<i>Lepomis auritus</i> , redbreast sunfish	0	24 (49-160)	186 (19-173)	0	0	18 (66-125)	11 (66-141)
<i>L. cyanellus</i> , green sunfish	0	1 (62)	24 (35-131)	16 (45-126)	6 (60-145)	19 (48-164)	0
<i>L. gibbosus</i> , pumpkinseed	0	2 (97-99)	14 (74-133)	85 (55-165)	2 (60-145)	1 (72)	63 (49-122)
<i>L. macrochirus</i> , bluegill	0	2 (81-178)	7 (59-87)	166 (46-134)	38 (85-145)	7 (55-91)	9 (46-131)
<i>Micropterus dolomieu</i> , smallmouth bass	1 (57)	2 (210-282)	2 (30-283)	0	0	23 (30-300)	0
<i>M. salmoides</i> , largemouth bass	0	0	3 (61-233)	32 (27-441)	3 (61-157)	35 (44-69)	5 (42-145)
<i>Pomoxis nigromaculatus</i> , black crappie	0	0	2 (43-173)	0	1 (168)	0	0

FAMILY	01440000	01451800	01464907	01467150	01470779	01472157	01477120
scientific name							
common name							
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PERCIDAE							
<i>Etheostoma olmstedi</i> , tessellated darter	117 (43-71)	38 (35-79)	170 (39-76)	207 (31-73)	50 (31-69)	64 (35-75)	50 (32-78)
<i>Perca flavescens</i> , yellow perch	0	0	0	3 (56-71)	0	0	0
<i>Percina peltata</i> , shield darter	59 (35-92)	0	0	0	0	31 (66-90)	0