

WATER QUALITY AT MISCELLANEOUS SITES

DELAWARE RIVER BASIN NATIONAL WATER-QUALITY ASSESSMENT PROGRAM, TRACE ELEMENTS AND ORGANOCHLORINE COMPOUNDS
IN FISH TISSUE RESULTS, JULY-AUGUST 1998 AND JUNE-AUGUST 1999

The purpose of this survey was to assess the occurrence and distribution of trace metals (table 1) and organochlorine compounds (tables 2 & 3) in fish tissue. Samples were collected from sites throughout the Delaware River Basin in New Jersey, New York, and Pennsylvania. The following species were collected: white sucker (*Catostomus commersoni*), common carp (*Cyprinus carpio*), and smallmouth bass (*Micropterus dolomieu*). More information regarding methods can be found in Crawford and Luoma, 1993, Guidelines for studies of contaminants in biological tissues for the National Water-Quality Assessment program: U.S. Geological Survey Open-File Report 92-494, 69 p.

Concentrations of trace elements in fish-liver composites, calendar years 1998 and 1999

Each sample for trace elements analyses consisted of a composite of liver tissue from 5-10 fish. Laboratory procedures included (1) drying, (2) digestion, and (3) analysis by use of inductively coupled plasma emission spectrometry (for Al, Ba, B, Cr, Cu, Fe, Mn, Sr, and Zn), inductively coupled plasma mass spectrometry (for Sb, As, Be, Cd, Co, Pd, Mo, Ni, Se, Ag, U, and V), and cold vapor atomic absorption (for Hg). Constituent concentrations are provided on a dry-weight (DW) basis.

REMARKS.--For the definition of the type of quality-control data listed under SAMPLE TYPE, refer to "Quality-control data" in the "Explanation of Records" section.

STATION NUMBER	STATION NAME	DATE	TIME	SAMPLE TYPE
01423000	WEST BRANCH DELAWARE RIVER AT WALTON, NY	08-16-99	1400	ENVIRONMENTAL
01423000	WEST BRANCH DELAWARE RIVER AT WALTON, NY	08-16-99	1445	SPLIT REPLICATE
01434000	DELAWARE RIVER AT PORT JERVIS, NY	07-30-98	0815	ENVIRONMENTAL
01435000	NEVERSINK RIVER NEAR CLARYVILLE, NY	08-17-99	1050	ENVIRONMENTAL
01437500	NEVERSINK RIVER AT GODEFFROY, NY	08-17-99	1650	ENVIRONMENTAL
01442110	BRODHEAD CREEK AT STROUDSBURG, PA	08-03-99	1430	ENVIRONMENTAL
01451425	LITTLE LEHIGH CREEK NEAR EAST TEXAS, PA	08-27-98	1005	ENVIRONMENTAL
01451800	JORDAN CREEK NEAR SCHNECKSVILLE, PA	07-16-99	0945	ENVIRONMENTAL
01454700	LEHIGH RIVER AT GLENDON, PA	08-04-98	1115	ENVIRONMENTAL
01454700	LEHIGH RIVER AT GLENDON, PA	08-04-98	1415	ENVIRONMENTAL
01463500	DELAWARE RIVER AT TRENTON, NJ	07-29-98	0900	ENVIRONMENTAL
01463500	DELAWARE RIVER AT TRENTON, NJ	07-29-98	1000	ENVIRONMENTAL
01464907	LITTLE NESHAMINY C AT VALLEY ROAD NR NESHAMINY, PA	09-01-98	1405	ENVIRONMENTAL
01467040	PENNYPACK CREEK AT PAPER MILL, PA	07-26-99	1526	ENVIRONMENTAL
01467150	COOPER RIVER AT HADDONFIELD, NJ	07-14-99	1545	ENVIRONMENTAL
01467150	COOPER RIVER AT HADDONFIELD, NJ	07-14-99	1550	ENVIRONMENTAL
01470779	TULPEHOCKEN CR NR BERNVILLE, PA	08-25-98	1105	ENVIRONMENTAL
01471520	WYOMISSING CR. @ WEST READING, PA	07-29-99	1100	ENVIRONMENTAL
01471668	HAY CREEK NEAR BIRDSBORO, PA	08-26-98	1405	ENVIRONMENTAL
01471980	MANATAWNY CREEK NEAR POTTSTOWN, PA	08-26-98	0905	ENVIRONMENTAL
01471980	MANATAWNY CREEK NEAR POTTSTOWN, PA	08-26-98	1005	SPLIT REPLICATE
01472157	FRENCH CREEK NEAR PHOENIXVILLE, PA	07-20-99	1035	ENVIRONMENTAL
01473990	WISSAHICKON CREEK BL WALNUT LANE NR MANAYUNK, PA	07-28-99	1850	ENVIRONMENTAL
01474500	SCHUYLKILL RIVER AT PHILADELPHIA, PA	07-28-98	1000	ENVIRONMENTAL
01474500	SCHUYLKILL RIVER AT PHILADELPHIA, PA	07-28-98	1400	ENVIRONMENTAL
01475510	DARBY CREEK NEAR DARBY, PA	07-28-99	1100	ENVIRONMENTAL
01477120	RACCOON CREEK NEAR SWEDESBORO, NJ	09-02-98	1135	ENVIRONMENTAL

WATER QUALITY AT MISCELLANEOUS SITES--Continued

DELAWARE RIVER BASIN NATIONAL WATER-QUALITY ASSESSMENT PROGRAM, TRACE ELEMENTS AND ORGANOCHLORINE COMPOUNDS IN FISH TISSUE RESULTS, JULY-AUGUST 1998 AND JUNE-AUGUST 1999

STATION NUMBER	DATE	TIME	SPECIES	TOTAL LENGTH, MEDIAN (MM)	TOTAL LENGTH, MIN MAX (MM)	WEIGHT, MEDIAN (GM)	WEIGHT, MIN MAX (GM)	NUMBER IN COMPOSITE
01423000	08-16-99	1400	WHITE SUCKER	299	275 323	497	397 614	8
01423000	08-16-99	1445	WHITE SUCKER	368	338 417	478	391 696	8
01434000	07-30-98	0815	WHITE SUCKER	443	381 496	860	620 1200	8
01435000	08-17-99	1050	WHITE SUCKER	465	411 481	939	761 1114	6
01437500	08-17-99	1650	WHITE SUCKER	432	394 486	901	572 1273	7
01442110	08-03-99	1430	WHITE SUCKER	415	380 449	816	548 1069	6
01451425	08-27-98	1005	WHITE SUCKER	335	313 431	397	320 802	8
01451800	07-16-99	0945	WHITE SUCKER	385	323 446	573	322 905	8
01454700	08-04-98	1115	COMMON CARP	640	611 711	4435	3506 6081	5
01454700	08-04-98	1415	WHITE SUCKER	390	310 520	754	395 1559	8
01463500	07-29-98	0900	WHITE SUCKER	352	304 485	477	351 1039	8
01463500	07-29-98	1000	COMMON CARP	580	462 670	2525	1332 4200	8
01464907	09-01-98	1405	WHITE SUCKER	259	235 296	174	138 275	9
01467040	07-26-99	1526	WHITE SUCKER	298	273 355	288	237 486	8
01467150	07-14-99	1545	COMMON CARP	442	383 503	1178	844 1739	6
01467150	07-14-99	1550	WHITE SUCKER	285	261 320	238	190 350	8
01470779	08-25-98	1105	WHITE SUCKER	308	290 370	301	239 477	10
01471520	07-29-99	1100	WHITE SUCKER	297	273 345	283	207 455	8
01471668	08-26-98	1405	WHITE SUCKER	248	225 257	147	104 170	10
01471980	08-26-98	0905	WHITE SUCKER	393	364 465	646	503 1078	8
01471980	08-26-98	1005	WHITE SUCKER	381	332 504	620	425 1205	8
01472157	07-20-99	1035	WHITE SUCKER	343	322 443	407	340 943	8
01473990	07-28-99	1850	WHITE SUCKER	293	288 302	331	276 346	4
01474500	07-28-98	1000	COMMON CARP	619	520 754	3139	2225 6200	8
01474500	07-28-98	1400	WHITE SUCKER	428	390 488	782	652 1284	8
01475510	07-28-99	1100	WHITE SUCKER	341	289 405	446	284 858	8
01477120	09-02-98	1135	WHITE SUCKER	314	262 336	314	188 425	8

STATION NUMBER	DATE	WATER, PRESENT BIO TIS DRY WGT REC PERCENT (49273)	ALUMI-NUM, BIOTA, TISSUE, DRY WGT REC (UG/G) (49237)	ANTI-MONY, BIOTA, TISSUE, DRY WGT REC (UG/G) (49246)	ARSENIC, BIOTA, TISSUE, DRY WGT REC (UG/G) (49247)	BARIUM, BIOTA, TISSUE, DRY WGT REC (UG/G) (49238)	BERYL-LIUM-, BIOTA, TISSUE, DRY WGT REC (UG/G) (49248)	BORON, BIOTA, TISSUE, DRY WGT REC (UG/G) (49239)
01423000	08-16-99	74	2.0	<.3	.4	<.1	<.3	.7
01423000	08-16-99	78	2.5	<.3	.4	.1	<.3	.6
01434000	07-30-98	74	4.8	<.3	.3	<.1	<.3	.9
01435000	08-17-99	77	7.8	<.3	.4	.3	<.3	.7
01437500	08-17-99	71	3.9	<.2	.3	<.1	<.2	.5
01442110	08-03-99	74	1.8	<.2	.4	<.1	<.2	.6
01451425	08-27-98	75	<1.0	<.2	.5	1.9	<.2	.9
01451800	07-16-99	75	1.8	<.3	.4	<.1	<.3	1.1
01454700	08-04-98	64	13	<.1	.3	<.1	<.1	.2
01454700	08-04-98	55	1.4	<.2	<.2	<.1	<.2	.5
01463500	07-29-98	66	2.4	<.3	<.3	<.1	<.3	.9
01463500	07-29-98	72	9.9	<.2	1.0	<.1	<.2	.3
01464907	09-01-98	80	1.9	<.3	.4	.2	<.3	.8
01467040	07-26-99	76	2.0	<.3	.4	<.1	<.3	1.1
01467150	07-14-99	78	22	<.2	.6	.3	<.2	1.2
01467150	07-14-99	69	1.6	<.2	.3	<.1	<.2	.9
01470779	08-25-98	77	1.4	<.2	.6	<.1	<.2	.7
01471520	07-29-99	80	1.3	<.3	.6	.2	<.3	2.4
01471668	08-26-98	81	2.1	<.4	.5	.3	<.4	1.6
01471980	08-26-98	73	<1.0	<.2	.4	4.0	<.2	.8
01471980	08-26-98	70	1.1	<.2	.4	3.2	<.2	.4
01472157	07-20-99	71	1.1	<.3	.4	<.1	<.3	.3
01473990	07-28-99	75	4.1	<.3	<.3	.2	<.3	1.4
01474500	07-28-98	69	8.2	<.2	.6	5.1	<.2	.3
01474500	07-28-98	76	1.8	<.2	<.2	<.1	<.2	1.0
01475510	07-28-99	75	<1.0	<.4	<.4	<.1	<.4	.9
01477120	09-02-98	78	1.9	<1.0	<1.0	5.4	<1.0	.8

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STATION NUMBER	DATE	CADMIUM	CHROM-	COBALT,	COPPER,	IRON,	LEAD,	MANGAN-	MERCURY
		BIOTA, TISSUE, DRY WGT REC (UG/G) (49249)	IUM-, BIOTA, TISSUE, DRY WGT REC (UG/G) (49240)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49250)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49241)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49242)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49251)	ESE, BIOTA, TISSUE, DRY WGT REC (UG/G) (49243)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49258)
01423000	08-16-99	2.0	<.5	<.3	34	890	<.3	7.4	.4
01423000	08-16-99	1.5	<.5	<.3	36	<1.0	<.3	9.3	.3
01434000	07-30-98	5.5	<.5	<.3	41	1300	<.3	7.3	.307
01435000	08-17-99	5.8	<.5	<.3	29	820	<.3	7.6	.3
01437500	08-17-99	3.1	<.5	<.2	22	570	<.2	4.9	.3
01442110	08-03-99	1.6	<.5	<.2	28	960	<.2	5.1	.2
01451425	08-27-98	1.1	.5	.4	27	440	<.2	6.2	<.2
01451800	07-16-99	1.8	<.5	.5	23	260	<.3	6.4	.2
01454700	08-04-98	27	<.5	.2	86	140	.3	3.4	.2
01454700	08-04-98	.9	<.5	.3	17	190	<.2	2.2	.03
01463500	07-29-98	3.2	<.5	.3	22	470	<.3	3.5	.07
01463500	07-29-98	16	<.5	.3	94	580	.3	3.1	.2
01464907	09-01-98	.8	<.5	<.3	61	750	<.3	9.2	<.3
01467040	07-26-99	2.3	<.5	.4	76	2000	<.3	6.1	.2
01467150	07-14-99	5.1	<.5	1.1	140	1500	.3	4.9	.1
01467150	07-14-99	.3	<.5	.8	24	800	<.2	3.7	.1
01470779	08-25-98	.6	<.5	.4	80	1200	<.2	6.7	.0
01471520	07-29-99	.7	<.5	<.3	48	780	.4	9.2	.2
01471668	08-26-98	.7	.6	.4	56	840	<.4	13	<.4
01471980	08-26-98	.9	<.5	.2	30	680	<.2	4.3	<.2
01471980	08-26-98	1.5	<.5	.2	28	360	<.2	4.0	<.2
01472157	07-20-99	2.1	<.5	.3	33	1000	<.3	5.3	.1
01473990	07-28-99	<.3	<.5	<.3	43	480	.3	8.1	.1
01474500	07-28-98	5.3	<.5	.5	65	690	.4	3.6	.2
01474500	07-28-98	1.5	<.5	1.2	33	860	.4	3.9	.213
01475510	07-28-99	1.5	<.5	<.4	61	530	<.4	4.8	.2
01477120	09-02-98	1.6	.5	<1.0	68	1500	<1.0	6.7	<.1
STATION NUMBER	DATE	MOLYB-	NICKEL,	SELEN-	SILVER,	STRON-	VANA-	ZINC,	URANIUM
		DENUM, BIOTA, TISSUE, DRY WGT REC (UG/G) (49252)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49253)	IUM, BIOTA, TISSUE, DRY WGT REC (UG/G) (49254)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49255)	TIUM, BIOTA, TISSUE, DRY WGT REC (UG/G) (49244)	DIUM BIO TIS DRY WGT REC (UG/G) (49465)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49245)	BIOTA, TISSUE, DRY WGT REC (UG/G) (49257)
01423000	08-16-99	.8	1.0	5.2	.3	.1	<.3	83	<.3
01423000	08-16-99	.9	<.3	4.5	.5	.3	<.3	87	<.3
01434000	07-30-98	.7	.4	4.2	.5	.1	.4	90	<.3
01435000	08-17-99	.8	.4	6.0	<.3	.4	<.3	83	<.3
01437500	08-17-99	.7	<.2	4.0	.3	.2	<.2	70	<.2
01442110	08-03-99	.8	<.2	4.6	.3	.3	<.2	67	<.2
01451425	08-27-98	1.1	<.2	7.3	<.2	.1	.5	91	<.2
01451800	07-16-99	.9	.4	8.0	<.3	.3	<.3	91	<.3
01454700	08-04-98	.9	.2	5.6	2.1	.1	.4	370	<.1
01454700	08-04-98	.5	.2	2.6	<.2	<.1	<.2	50	<.2
01463500	07-29-98	.5	.4	2.0	<.3	.1	<.3	64	<.3
01463500	07-29-98	.8	<.2	4.3	1.0	.3	.5	1000	<.2
01464907	09-01-98	1.2	<.3	7.3	.6	1.0	1.4	160	<.3
01467040	07-26-99	1.5	<.3	9.2	.6	.4	.8	170	<.3
01467150	07-14-99	1.4	.5	8.9	1.5	.9	.8	1200	<.2
01467150	07-14-99	.7	.6	4.4	<.2	.4	<.2	65	<.2
01470779	08-25-98	1.2	.5	8.5	<.2	.2	.6	140	<.2
01471520	07-29-99	1.1	<.3	11	<.3	.5	<.3	110	<.3
01471668	08-26-98	1.4	.7	9.2	<.4	.3	.7	130	<.4
01471980	08-26-98	.8	.4	5.5	<.2	.2	.8	81	<.2
01471980	08-26-98	.8	<.2	6.0	<.2	.2	.9	73	<.2
01472157	07-20-99	.7	<.3	7.2	<.3	.2	.3	80	<.3
01473990	07-28-99	.9	<.3	6.7	.6	.4	<.3	89	<.3
01474500	07-28-98	.9	<.2	6.5	.8	.4	1.2	880	<.2
01474500	07-28-98	.9	.4	5.0	<.2	.2	.7	92	<.2
01475510	07-28-99	1.1	<.4	8.1	<.4	.4	.9	130	<.4
01477120	09-02-98	1.0	<1.0	6.6	<1.0	.3	<1.0	160	<1.0