

BIOLOGICAL STREAM SURVEY

ROCKLAND COUNTY, NEW YORK LOTIC SCENE INVESTIGATION (LSI) 2011 STREAM BIOMONITORING WATER QUALITY PROJECT



PREPARED BY
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SCHENECTADY, NEW YORK

FOR
ROCKLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT
POMONA, NEW YORK

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Introduction

This report summarizes the results from the benthic samples collected and analyzed for Rockland County in 2011. This project is supported by the Rockland County Soil and Water Conservation District. The data is part of an ongoing assessment of Rockland County stream communities since 2006 (Figure 1); for complete project overview, history, rationale, background, project goals, methods, key terminology and interpretation of 2006-2011 data, see the Rockland County reports website: www.rocklandgov.com/environment

Benthic kick samples were collected at 20 stations over a 4 day period (August 9 – 12, 2011). Thirteen of the stations had been previously sampled in at least one year during 2006 – 2010; stations are re-sampled periodically for trend monitoring. The eight new stations that were assessed were selected to establish baseline water quality and augment water quality assessments on the same stream (Figure 2). Data was analyzed using New York State Department of Environmental Conservation (NYS DEC) methodology to determine a biological assessment profile (BAP), indicating overall water quality at each test site.

Figure 1. Map of 2006-2011 station locations in Rockland County, NY. Watershed delineation and watershed names are based on hydrological drainage units originated by the U.S. Geological Survey New York Water Science Center and U.S Department of Agriculture, New York State Natural Resources Conservation Service (published in 2008). *Indicates the locally recognized name of the watershed.

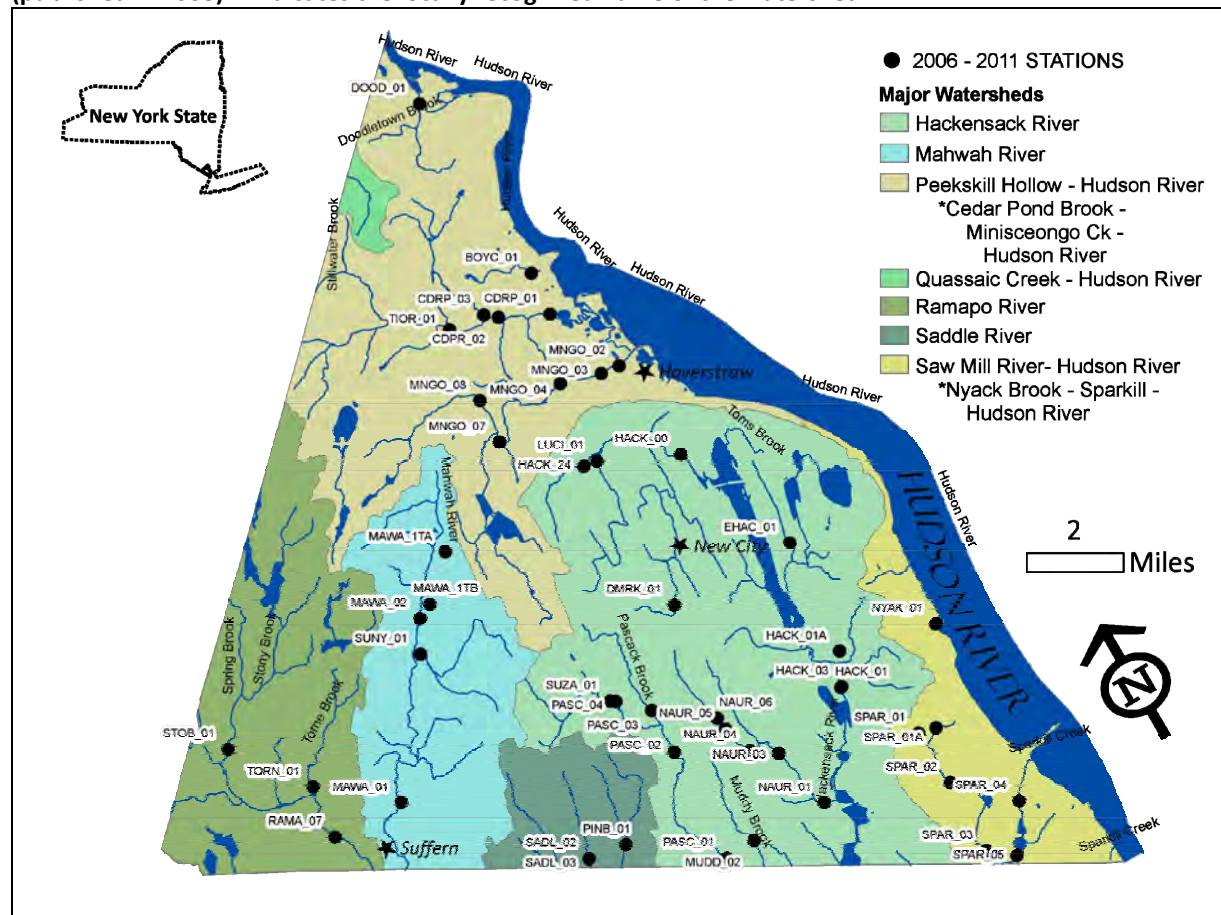
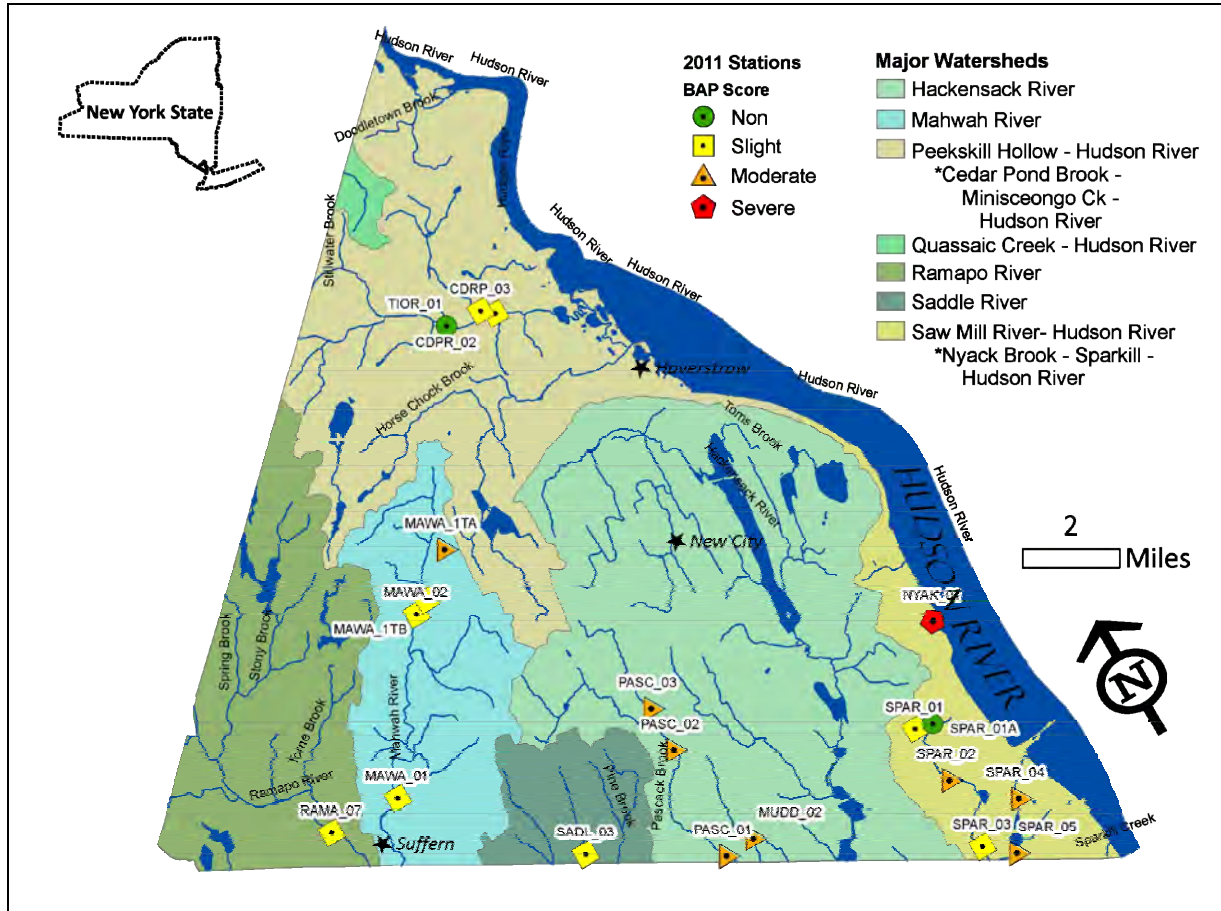


Figure 2. Map of 2011 station locations in Rockland County, NY. Watershed delineation and watershed names are based on hydrological drainage units originated by the U.S. Geological Survey New York Water Science Center and U.S Department of Agriculture, New York State Natural Resources Conservation Service (published in 2008). *Indicates the locally recognized name of the watershed.



Summary of Results

The 2011 biological community metrics indicated Rockland County water quality ranged from non-impacted to severely impacted: 2 sites were non-impacted, 9 were slightly impacted, 8 were moderately impacted, and 1 was severely impacted (Figure 2 and Table 1).

Comparison of the biological assessment profile (BAP) for each station to prior data shows water quality declined (BAP dropped at least 0.5 points) at 4 stations, improved at 2 stations, and remained the same at 7 stations (Table 2). There was no comparison data available for 6 stations. Of the 4 stations with declining water quality, the BAP dropped enough at two stations to reclassify them into a worse impact category. One of the 2 stations with improved water quality remained in the same impact category and the other was reclassified into a higher category.

The variability in water quality, in part, reflects land use in each of the major stream basins. Areas with greater percentage of forested land have been associated with higher water quality scores since 2006

than areas of greater development or agriculture (Figure 3). Forested areas usually contain fewer sources of pollutants and superior ability to buffer impacts. Greater impervious surface associated with development results in more runoff of pollutants; chemicals applied to lawns and crops, and livestock waste, also impact streams through runoff.

Figure 3. Percentage of land use and mean BAP scores for years 2006 – 2011 within each major watershed. N = number of samples, dashed line indicates minimum and maximum scores.

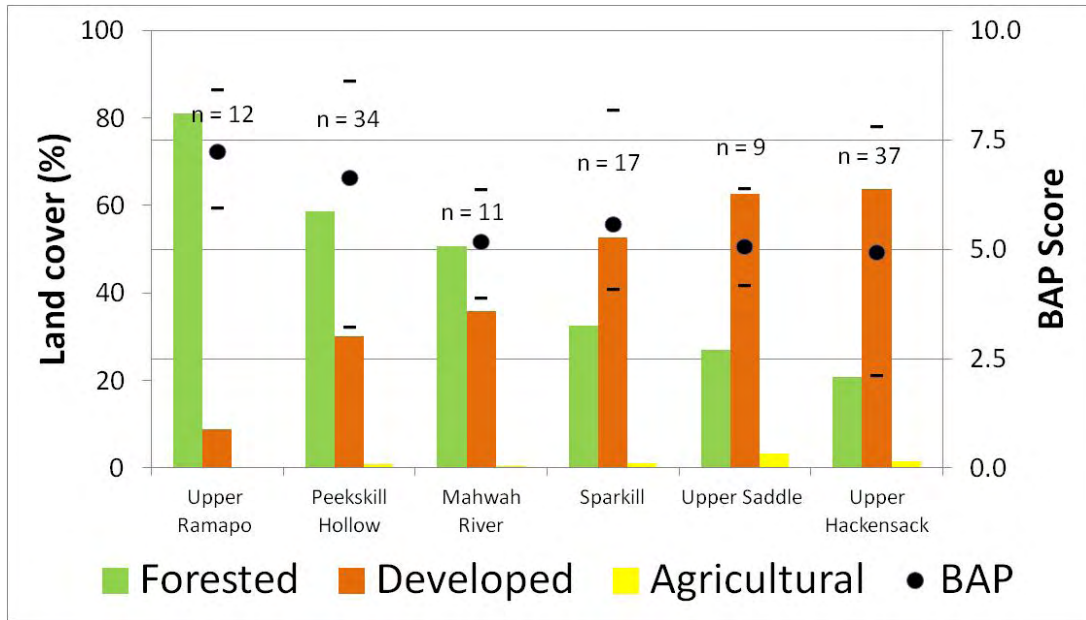


Table 1. Benthic macroinvertebrate metric scores and impact source determination percentages for the 20 stream sites sampled in 2011 throughout Rockland County, NY. Bolded numbers indicate most likely source of impact to stream community. TR= taxa richness; BI= biotic index; EPT = Ephemeroptera-Plecoptera-Trichoptera taxa; PMA= percent model affinity; BAP = biotic assessment profile; Nat=natural; NPN = non-point nutrient; Org = organic inputs; Imp= impoundment; Complex= municipal/industrial/nutrients; NBI-N = Nutrient Biotic Index for nitrogen; NBI-P = Nutrient Biotic Index for phosphorus. *Stations added in 2011; all other stations have been previously sampled at least once during 2006-2010.

Stream Name	Station	Biotic Metrics					Impact Source Determination (ISD)							NBI metrics	
		TR	BI	EPT	PMA	BAP	Nat	NPN	Org	Complex	Toxic	Silt	Imp	NBI-N	NBI-P
Cedar Pond Brook	CDPR_02	28	4.6	14	49	7.47	42	67	53	56	37	42	62	5.36	5.40
Cedar Pond Brook	TIOR_01	26	2.8	18	51	7.96	49	52	18	37	25	18	42	4.76	4.47
Mahwah River	MAWA_01	16	5.1	5	47	5.07	40	61	37	47	41	43	50	7.19	7.20
Mahwah River	MAWA_02*	18	4.8	8	48	5.77	47	61	65	52	55	56	58	7.14	6.87
Muddy Creek	MUDD_02	14	6	3	47	4.36	29	47	39	57	54	37	48	7.91	7.18
Nyack Brook	NYAK_01*	7	6.3	1	33	2.41	1	20	31	40	10	11	42	6.84	9.27
Pascack Brook	PASC_01	16	5.7	4	35	4.27	20	56	59	64	36	39	61	6.29	6.09
Pascack Brook	PASC_02	14	5.8	4	38	4.23	20	59	57	62	39	39	59	6.86	6.56
Pascack Brook	PASC_03*	17	5.9	3	38	4.26	20	51	55	60	37	38	62	7.06	6.43
Ramapo River	RAMA_07	16	4.1	10	59	6.51	49	63	51	53	39	39	59	5.92	6.25
Saddle River	SADL_03	17	4.9	6	41	5.17	45	66	44	47	50	42	50	6.80	5.93
Sparkill	SPAR_01	20	4.9	8	48	5.93	32	60	48	50	44	41	53	7.27	7.12
Sparkill	SPAR_01A*	25	3.5	12	75	8.16	43	32	20	19	24	30	29	6.56	6.95
Sparkill	SPAR_02	15	5.8	3	38	4.14	29	54	59	59	38	44	52	8.36	7.94
Sparkill	SPAR_03	15	5.8	6	49	5.05	29	56	55	64	50	50	55	7.20	6.92
Sparkill	SPAR_04	16	6.1	4	46	4.60	28	50	59	57	50	48	55	8.25	7.34
Sparkill	SPAR_05*	16	6	3	50	4.67	29	46	54	60	47	47	53	7.99	7.38
Timp Mtn. Brook	CDRP_03	23	5.3	13	40	6.36	40	58	63	62	43	49	69	5.76	6.08
Unnamed Tributary	MAWA_1TA*	16	4.8	7	28	4.68	33	68	52	58	41	37	62	6.97	7.03
Unnamed Tributary	MAWA_1TB*	17	4.6	6	43	5.33	42	55	47	51	50	38	51	7.82	7.46

Table 2 Biological Assessment Profile (BAP) scores from 2006-2011, the relative difference between 2011 and the most previous BAP values, and the overall change in water quality status (a difference of $\geq\pm 0.5$ points).

Stream Name	Station	BAP 2006	BAP 2007	BAP 2008	BAP 2009	BAP 2010	BAP 2011	Diff	Change
Cedar Pond Brook	CDPR_02	8.6	7.9	---	6.91	---	7.47	0.56	Improve
Cedar Pond Brook	TIOR_01	7.11	8.87	8.4	---	7.06	7.96	0.90	Improve
Mahwah River	MAWA_01	5.2	5.07	3.91	5.22	6.38	5.07	-1.31	Decline
Mahwah River	MAWA_02	---	---	---	---	---	5.77	---	N/A
Muddy Creek	MUDD_02	4.97	4.92	---	5.09	4.35	4.36	0.01	No change
Nyack Brook	NYAK_01	---	---	---	---	---	2.41	---	N/A
Pascack Brook	PASC_01	---	---	5.76	---	---	4.27	-1.49	Decline
Pascack Brook	PASC_02	6.39	5.55	---	---	---	4.23	-1.32	Decline
Pascack Brook	PASC_03	---	---	---	---	---	4.26	---	N/A
Ramapo River	RAMA_07	7.29	6.01	5.97	7.58	6.54	6.51	-0.03	No change
Saddle River	SADL_03	---	---	4.84	5.34	6	5.17	-0.83	Decline
Sparkill	SPAR_01	---	---	6.17	---	---	5.93	-0.24	No change
Sparkill	SPAR_01A	---	---	---	---	---	8.16	---	N/A
Sparkill	SPAR_02	5.09	5.89	---	4.54	4.29	4.14	-0.15	No change
Sparkill	SPAR_03	---	---	4.57	---	---	5.05	0.48	No change
Sparkill	SPAR_04	4.73	5.46	4.64	4.6	4.29	4.60	0.31	No change
Sparkill	SPAR_05	---	---	---	---	---	4.67	---	N/A
Timp Mtn. Brook	CDRP_03	8	7.98	---	6.13	---	6.36	0.23	No change
Unnamed Tributary	MAWA_1TA	---	---	---	---	---	4.68	---	N/A
Unnamed Tributary	MAWA_1TB	---	---	---	---	---	5.33	---	N/A

Appendix

A Field and Lab Data Summary page was created for each of the stations sampled, including: site location, number, sampling date, physical and chemical data, and site photos as well as the taxa identified for each sub-sample.

Field Data Summary

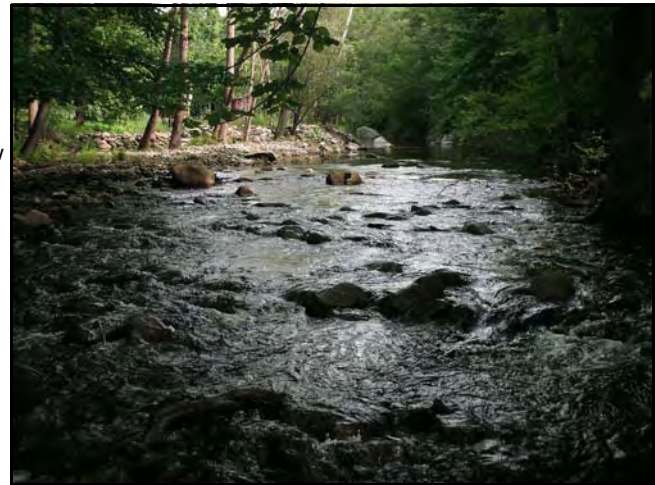
Waterbody: **Cedar Pond Brook**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **TIOR 01**
 Coll Date: **8/9/2011**
 Site description: **Just above Rt. 210 bridge**

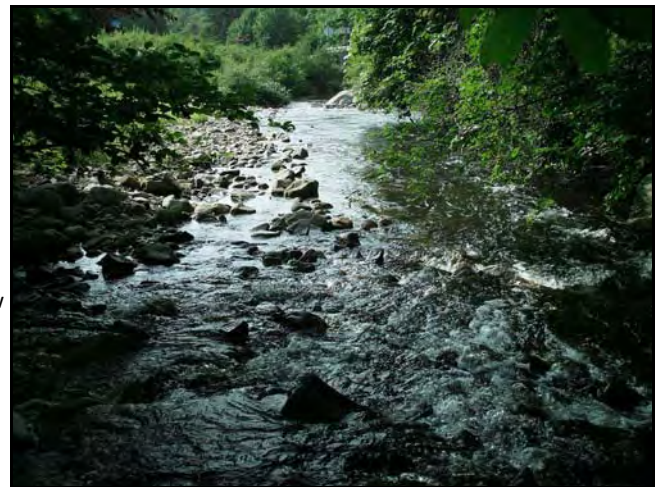
Latitude: **41.2382**
 Longitude: **-74.0221**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.3
Width (meters):	8
Current (cm/sec):	65
Canopy (%):	70
Substrate	
Rock (%):	20
Rubble (%):	30
Gravel (%):	25
Sand (%):	20
Silt (%):	5
Embeddedness (%):	25
Chemical Measurements	
DO (mg/L):	8.78
DO sat. (%):	96.8
Temperature (C):	20.15
Spec. Conduct. (umhos):	90
Baro pressure:	748.4
pH:	6.83
Salinity (PSS):	0.04
Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	Y
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Very good

Flow
↓



↑
Flow



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Cedar Pond Brook**

Station: **TIOR_01**

County: **Rockland** State: **NY**

Collection Date: **8/9/2011**

Order	Family	Genus/species	Total #			
BASOMMATOPHOR	Physidae	Physella sp.	1			
COLEOPTERA	Psephenidae	Psephenus herricki	1			
DIPTERA	Chironomidae	Thienemannimyia gr. spp.	1			
		Microtendipes rydalensis gr.	1			
		Polypedilum aviceps	36			
		Rheocricotopus sp.	1			
		Empididae	Hemerodromia sp.	1		
		Tipulidae	Hexatoma sp.	2		
		EPHEMEROPTERA	Baetidae	Plauditus sp.	1	
				Baetis sp.	3	
				Ephemerellidae	Ephemerella sp.	1
				Heptageniidae	Epeorus sp.	2
	Leucrocuta sp.			1		
	Stenonema sp.			1		
PLECOPTERA	Isonychiidae	Isonychia sp.	2			
	Chloroperlidae	Sweltsa sp.	1			
	Leuctridae	Leuctra sp.	2			
	Perlidae	Acroneuria abnormis	1			
		Paragnetina media	1			
TRICHOPTERA	Glossosomatidae	Glossosoma sp.	1			
		Hydropsychidae	Hydropsyche bronta	2		
		Hydropsyche betteni	1			
		Hydropsyche morosa	1			
		Hydropsyche sparna	6			
	Lepidostomatidae	Lepidostoma sp.	6			
	Philopotamidae	Dolophilodes sp.	23			

Field Data Summary

Waterbody: **Cedar Pond Brook**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **CDRP 03**
 Coll Date: **8/9/2011**
 Site description: **Just above Old Rt 210 bridge**

Latitude: **41.2368**
 Longitude: **-74.0074**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.25
Width (meters):	4
Current (cm/sec):	70
Canopy (%):	80
Substrate	
Rock (%):	20
Rubble (%):	25
Gravel (%):	25
Sand (%):	25
Silt (%):	5
Embeddedness (%):	25
Chemical Measurements	
DO (mg/L):	8.22
DO sat. (%):	96.1
Temperature (C):	23.11
Spec. Conduct. (umhos):	143
Baro pressure:	749.9
pH:	7.71
Salinity (PSS):	0.07
Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	Y
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Very good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Cedar Pond Brook**

Station: **CDRP_03**

County: **Rockland** State: **NY**

Collection Date: **8/9/2011**

Order	Family	Genus/species	Total #			
COLEOPTERA	Psephenidae	Psephenus herricki	1			
DIPTERA	Chironomidae	Tanytarsus sp.	2			
		Sublettea coffmani	1			
		Rheotanytarsus sp.	15			
		Tvetenia vitracies	3			
		Cricotopus bicinctus	4			
		Polypedilum flavum	7			
		Cricotopus trifascia gr.	1			
		Empididae	Hemerodromia sp.	1		
		Tipulidae	Antocha sp.	1		
		EPHEMEROPTERA	Baetidae	Baetis intercalaris	1	
				Plauditus sp.	1	
				Heptageniidae	Stenonema modestum	1
				Isonychiidae	Isonychia sp.	3
PLECOPTERA	Perlidae	Paragnetina media	1			
TRICHOPTERA	Brachycentridae	Micrasema sp.	1			
		Hydropsychidae	Hydropsyche betteni	6		
	Cheumatopsyche sp.		27			
	Hydropsyche morosa		7			
	Hydropsyche sparna		5			
	Hydroptilidae		Hydroptila sp.	1		
	Philopotamidae		Chimarra aterrima?	9		
	Polycentropodidae	Polycentropus sp.	1			

Field Data Summary

Waterbody: **Cedar Pond Brook**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **CDRP 02**
 Coll Date: **8/9/2011**
 Site description: **Just above Reservoir Rd**

Latitude: **41.2339**
 Longitude: **-74.0030**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.3
Width (meters):	7
Current (cm/sec):	100
Canopy (%):	60
Substrate	
Rock (%):	15
Rubble (%):	25
Gravel (%):	25
Sand (%):	25
Silt (%):	10
Embeddedness (%):	25

Chemical Measurements	
DO (mg/L):	8.54
DO sat. (%):	96.8
Temperature (C):	21.59
Spec. Conduct. (umhos):	132
Baro pressure:	751.2
pH:	7.4
Salinity (PSS):	0.06

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	Y
Trichoptera:	Y
Coleoptera:	
Megaloptera:	Y
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Very good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Cedar Pond Brook**

Station: **CDRP_02**

County: **Rockland** State: **NY**

Collection Date: **8/9/2011**

Order	Family	Genus/species	Total #		
COLEOPTERA	Psephenidae	Psephenus herricki	1		
DIPTERA	Chironomidae	Rheocricotopus sp.	1		
		Brillia sp.	1		
		Parametricnemus sp.	1		
		Cardiocladius obscurus	1		
		Tvetenia vitracies	3		
		Rheotanytarsus sp.	1		
		Thienemannimyia gr. spp.	1		
		Polypedilum flavum	4		
		Polypedilum aviceps	12		
		Simuliidae	Simulium sp.	1	
		Tipulidae	Antocha sp.	1	
		EPHEMEROPTERA	Baetidae	Plauditus sp.	2
				Acentrella turbida	1
Ephemerellidae	Ephemerella sp.			1	
Heptageniidae	Epeorus sp.			1	
Isonychiidae	Isonychia sp.			3	
LUMBRICIDA	Lumbricina	Undetermined Lumbricina	2		
MEGALOPTERA	Corydalidae	Nigronia serricornis	1		
PLECOPTERA	Peltoperlidae	Tallaperla sp.	2		
		Perlidae	Acroneuria abnormis	4	
		Paragnetina immarginata	3		
TRICHOPTERA	Glossosomatidae	Glossosoma sp.	3		
		Hydropsychidae	Cheumatopsyche sp.	15	
			Hydropsyche sparna	15	
			Hydropsyche bronta	1	
			Hydropsyche betteni	8	
Hydropsyche morosa	10				

Field Data Summary

Waterbody: **Nyack Brook**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **NYAK 01**
 Coll Date: **8/9/2011**
 Site description: **Just above tennis courts**

Latitude: **41.0877**
 Longitude: **-73.9176**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	3
Current (cm/sec):	50
Canopy (%):	60
Substrate	
Rock (%):	20
Rubble (%):	25
Gravel (%):	20
Sand (%):	20
Silt (%):	15
Embeddedness (%):	60

Chemical Measurements	
DO (mg/L):	8.43
DO sat. (%):	95.3
Temperature (C):	21.34
Spec. Conduct. (umhos):	1010
Baro pressure:	751.9
pH:	8.15
Salinity (PSS):	0.50

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	Y
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	Flat worms
Field Faunal Condition:	Very poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Nyack Brook**

Station: **NYAK_01**

County: **Rockland** State: **NY**

Collection Date: **8/9/2011**

Order	Family	Genus/species	Total #
DIPTERA	Chironomidae	Eukiefferiella sp.	1
		Dicrotendipes sp.	1
		Cricotopus/Orthocladius Complex	24
		Polypedilum illinoense	31
		Empididae	Hemerodromia sp.
TRICHOPTERA	Hydroptilidae	Hydroptila sp.	3
TRICLADIDA		Undetermined Turbellaria	37

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

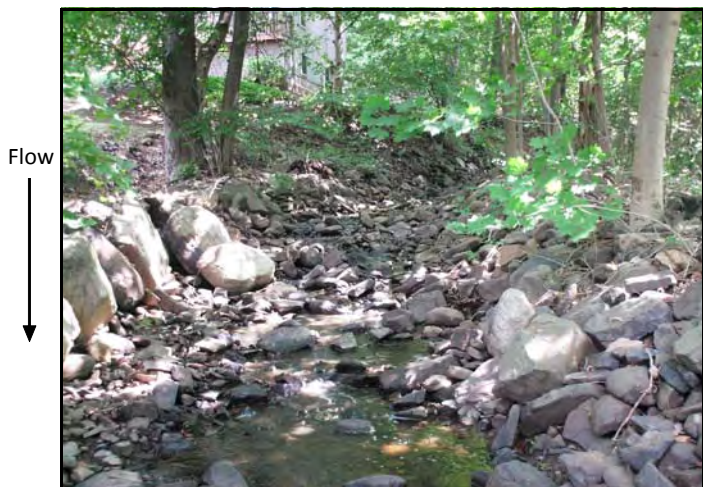
Station: **SPAR 01**
 Coll Date: **8/10/2011**
 Site description: **Just above Greenbush Rd bridge**

Latitude: **41.0619**
 Longitude: **-73.9456**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.25
Width (meters):	2
Current (cm/sec):	45
Canopy (%):	85
Substrate	
Rock (%):	15
Rubble (%):	25
Gravel (%):	25
Sand (%):	20
Silt (%):	15
Embeddedness (%):	25

Chemical Measurements	
DO (mg/L):	7.37
DO sat. (%):	83.4
Temperature (C):	21.45
Spec. Conduct. (umhos):	308
Baro pressure:	749.3
pH:	7.94
Salinity (PSS):	0.15

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_01**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #	
ARHYNCHOBDELLID	Erpobdellidae	Undetermined Erpobdellidae	1	
BASOMMATOPHOR	Physidae	Physella sp.	1	
COLEOPTERA	Elmidae	Stenelmis sp.	2	
	Psephenidae	Psephenus herricki	1	
DIPTERA	Chironomidae	Chaetocladius sp.	2	
		Polypedilum aviceps	4	
		Diamesa sp.	18	
		Polypedilum illinoense	3	
EPHEMEROPTERA	Heptageniidae	Stenonema sp.	1	
LUMBRICIDA	Lumbricina	Undetermined Lumbricina	8	
ODONATA	Aeschnidae	Boyeria vinosa	2	
	Calopterygidae	Calopteryx sp.	1	
PLECOPTERA	Perlidae	Acroneuria sp.	2	
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	23	
		Hydropsyche betteni	9	
		Diplectrona sp.	5	
		Lepidostomatidae	Lepidostoma sp.	1
		Philopotamidae	Chimarra aterrima?	11
TRICLADIDA		Dolophilodes sp.	3	
		Undetermined Turbellaria	2	

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **SPAR 01A**
 Coll Date: **8/10/2011**
 Site description: **Just south of Tackamac North Park entrance**

Latitude: **41.0609**
 Longitude: **-73.9389**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	1.5
Current (cm/sec):	158
Canopy (%):	80
Substrate	
Rock (%):	28
Rubble (%):	25
Gravel (%):	25
Sand (%):	15
Silt (%):	10
Embeddedness (%):	25

Chemical Measurements	
DO (mg/L):	5.83
DO sat. (%):	63.7
Temperature (C):	19.83
Spec. Conduct. (umhos):	158
Baro pressure:	746.9
pH:	7.33
Salinity (PSS):	0.07

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	
Trichoptera:	Y
Coleoptera:	Y
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_01A**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #
COLEOPTERA	Elmidae	Stenelmis sp.	5
	Psephenidae	Psephenus herricki	18
		Ectopria sp.	1
DIPTERA	Chironomidae	Polypedilum aviceps	2
		Thienemannimyia gr. spp.	12
		Parametriocnemus sp.	1
		Empididae	Neoplasta sp.
	Tipulidae	Hexatoma sp.	1
		Dicranota sp.	1
		Pseudolimnophila sp.	2
EPHEMEROPTERA	Ephemerellidae	Eurylophella funeralis	1
	Heptageniidae	Stenonema sp.	23
	Leptophlebiidae	Paraleptophlebia sp.	1
MEGALOPTERA	Corydalidae	Nigronia serricornis	1
ODONATA	Aeschnidae	Boyeria vinosa	1
	Gomphidae	Lanthus sp.	7
PLECOPTERA	Chloroperlidae	Sweltsa sp.	1
	Leuctridae	Leuctra sp.	1
	Peltoperlidae	Tallaperla sp.	2
	Perlidae	Acroneuria sp.	3
TRICHOPTERA	Hydropsychidae	Diplectrona sp.	4
		Cheumatopsyche sp.	1
	Philopotamidae	Dolophilodes sp.	8
		Chimarra sp.	1
	Polycentropodidae	Polycentropus sp.	1

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

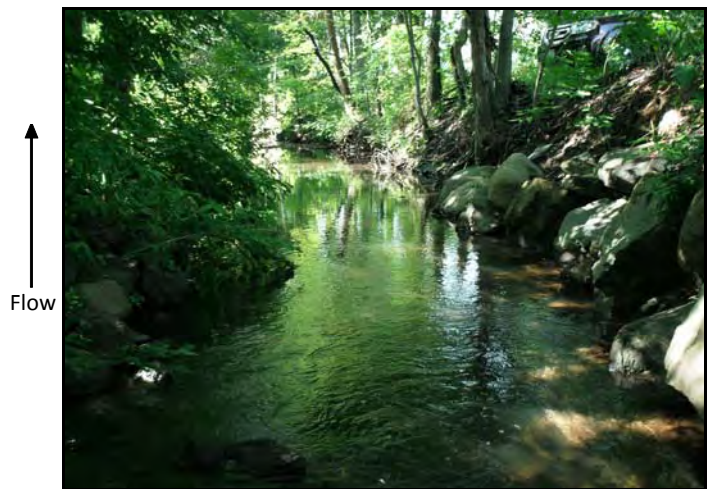
Station: **SPAR 02**
 Coll Date: **8/10/2011**
 Site description: **Just below Orangeburg Rd. Bridge**

Latitude: **41.0447**
 Longitude: **-73.9452**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.25
Width (meters):	3
Current (cm/sec):	55
Canopy (%):	65
Substrate	
Rock (%):	10
Rubble (%):	25
Gravel (%):	25
Sand (%):	25
Silt (%):	15
Embeddedness (%):	40

Chemical Measurements	
DO (mg/L):	6.79
DO sat. (%):	74.9
Temperature (C):	20.15
Spec. Conduct. (umhos):	495
Baro pressure:	750.6
pH:	7.41
Salinity (PSS):	0.24

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	Diptera
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_02**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #	
DIPTERA	Chironomidae	Tanytarsus sp.	6	
		Polypedilum fallax gr.	1	
		Diamesa sp.	25	
		Rheotanytarsus sp.	2	
		Polypedilum illinoense	4	
		Thienemannimyia gr. spp.	5	
		Rheocricotopus sp.	1	
		Polypedilum flavum	7	
		Empididae	Hemerodromia sp.	1
		Simuliidae	Simulium sp.	1
		Tipulidae	Antocha sp.	2
EPHEMEROPTERA	Baetidae	Tipula sp.	1	
		Baetis intercalaris	3	
TRICHOPTERA	Hydropsychidae	Hydropsyche betteni	27	
		Cheumatopsyche sp.	14	

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

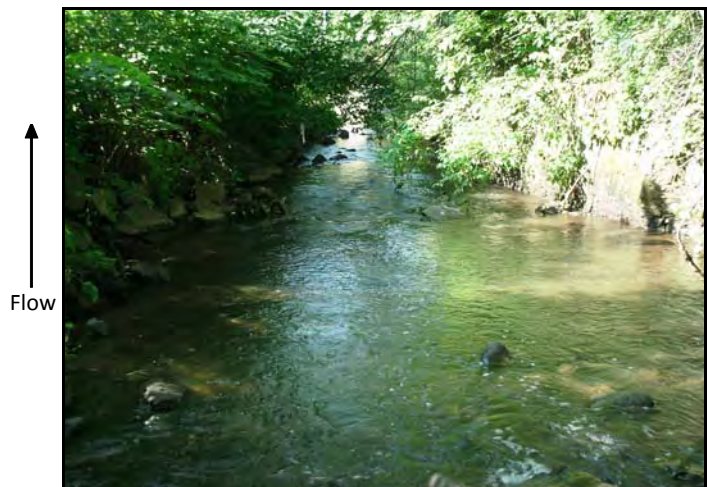
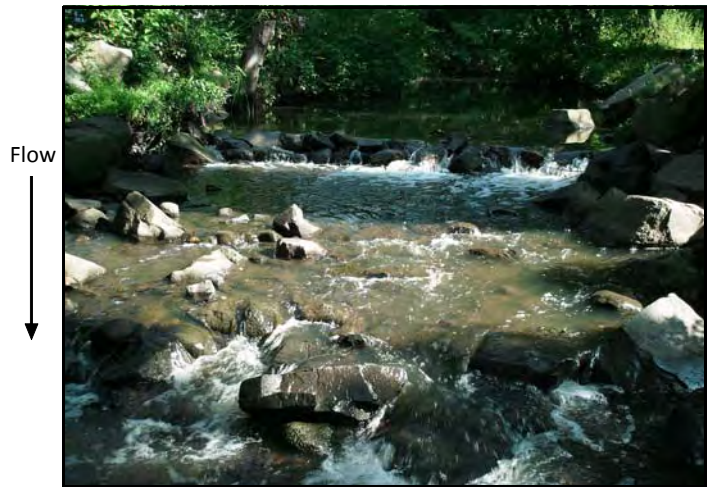
Station: **SPAR 03**
 Coll Date: **8/10/2011**
 Site description: **Just below Washington St. In park**

Latitude: **41.0205**
 Longitude: **-73.9471**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.3
Width (meters):	5
Current (cm/sec):	100
Canopy (%):	50
Substrate	
Rock (%):	15
Rubble (%):	25
Gravel (%):	25
Sand (%):	20
Silt (%):	15
Embeddedness (%):	40

Chemical Measurements	
DO (mg/L):	7.22
DO sat. (%):	81.5
Temperature (C):	21.16
Spec. Conduct. (umhos):	411
Baro pressure:	751.2
pH:	7.47
Salinity (PSS):	0.20

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	
Trichoptera:	Y
Coleoptera:	Y
Megaloptera:	
Odonata:	
Chironomidae:	
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_03**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #		
COLEOPTERA	Elmidae	Stenelmis sp.	5		
DIPTERA	Chironomidae	Polypedilum illinoense	1		
		Diamesa sp.	2		
		Cricotopus sp.	7		
		Polypedilum flavum	14		
		Rheotanytarsus sp.	3		
		Empididae	Hemerodromia sp.	1	
		Tipulidae	Antocha sp.	10	
		EPHEMEROPTERA	Baetidae	Baetis intercalaris	4
		TRICHOPTERA	Glossosomatidae	Glossosoma sp.	1
				Hydropsychidae	Cheumatopsyche sp.
Hydropsyche betteni	27				
Hydropsyche bronta	2				
Hydroptilidae	Hydroptila sp.			10	
TRICLADIDA		Undetermined Turbellaria	5		

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

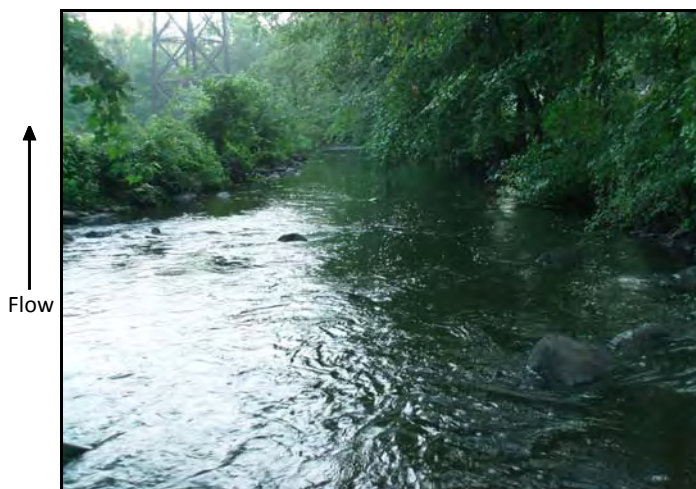
Station: **SPAR 04**
 Coll Date: **8/10/2011**
 Site description: **Just below Valentine St. Bridge**

Latitude: **41.0303**
 Longitude: **-73.9257**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	8
Current (cm/sec):	75
Canopy (%):	50
Substrate	
Rock (%):	10
Rubble (%):	25
Gravel (%):	25
Sand (%):	20
Silt (%):	20
Embeddedness (%):	40

Chemical Measurements	
DO (mg/L):	4.94
DO sat. (%):	55.8
Temperature (C):	21.67
Spec. Conduct. (umhos):	317
Baro pressure:	751.7
pH:	7.03
Salinity (PSS):	0.15

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	Y
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_04**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #
AMPHIPODA	Gammaridae	Gammarus sp.	35
COLEOPTERA	Elmidae	Stenelmis sp.	9
		Ancyronyx variegatus	2
DIPTERA	Chironomidae	Polypedilum flavum	9
		Thienemannimyia gr. spp.	1
		Tanytarsus sp.	1
		Dicrotendipes sp.	1
		Paratanytarsus sp.	1
		Polypedilum illinoense	1
	Empididae	Undetermined Empididae	1
	Tipulidae	Antocha sp.	1
EPHEMEROPTERA	Heptageniidae	Stenacron interpunctatum	2
ISOPODA	Asellidae	Caecidotea sp.	3
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	11
		Hydropsyche betteni	21
		Hydropsyche bronta	1

Field Data Summary

Waterbody: **Sparkill**
 River Basin: **Hudson**
 County: **Rockland**
 State: **NY**

Station: **SPAR 05**
 Coll Date: **8/10/2011**
 Site description: **Just below Oak Tree Rd. Bridge**

Latitude: **41.0157**
 Longitude: **-73.9373**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.25
Width (meters):	7
Current (cm/sec):	95
Canopy (%):	50
Substrate	
Rock (%):	
Rubble (%):	20
Gravel (%):	30
Sand (%):	25
Silt (%):	25
Embeddedness (%):	45

Chemical Measurements	
DO (mg/L):	5.12
DO sat. (%):	58
Temperature (C):	21.62
Spec. Conduct. (umhos):	335
Baro pressure:	752.1
pH:	7.12
Salinity (PSS):	0.16

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	Y
Mollusca:	
Oligochaeta:	
Other macro's:	Flat worms
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Sparkill**

Station: **SPAR_05**

County: **Rockland** State: **NY**

Collection Date: **8/10/2011**

Order	Family	Genus/species	Total #	
AMPHIPODA	Gammaridae	Gammarus sp.	36	
COLEOPTERA	Elmidae	Stenelmis sp.	10	
DIPTERA	Chironomidae	Polypedilum illinoense	1	
		Dicrotendipes sp.	1	
		Polypedilum flavum	13	
		Rheotanytarsus sp.	3	
		Cryptochironomus sp.	1	
		Microtendipes pedellus gr.	1	
		Tanytarsus sp.	1	
		Chironomus sp.	1	
		Tipulidae	Tipula sp.	1
		ISOPODA	Asellidae	Caecidotea sp.
TRICHOPTERA	Hydropsychidae	Hydropsyche bronta	2	
		Hydropsyche betteni	11	
		Cheumatopsyche sp.	15	
VENEROIDEA	Sphaeriidae	Sphaerium sp.	1	

Field Data Summary

Waterbody: **Pascack Brook**
 River Basin: **Hackensack**
 County: **Rockland**
 State: **NY**

Station: **PASC 01**
 Coll Date: **8/11/2011**
 Site description: **Just above W. Washington Ave bridge**

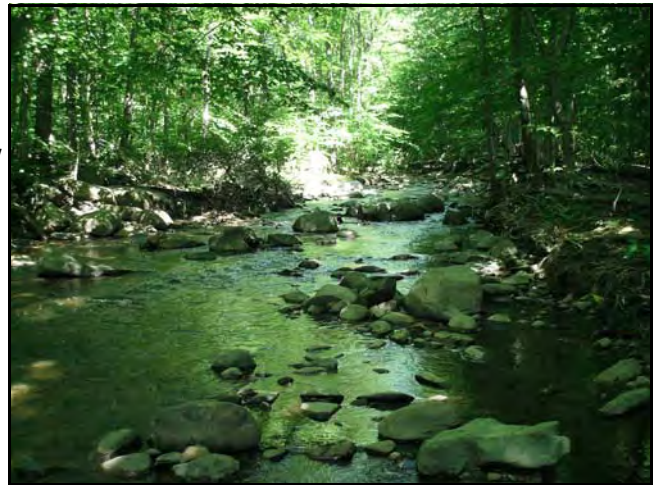
Latitude: **41.0598**
 Longitude: **-74.0365**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.3
Width (meters):	6
Current (cm/sec):	85
Canopy (%):	80
Substrate	
Rock (%):	20
Rubble (%):	25
Gravel (%):	20
Sand (%):	25
Silt (%):	10
Embeddedness (%):	60

Chemical Measurements	
DO (mg/L):	7.97
DO sat. (%):	87.8
Temperature (C):	19.58
Spec. Conduct. (umhos):	572
Baro pressure:	753
pH:	8.04
Salinity (PSS):	0.28

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Poor

Flow
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Flow



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Pascack Brook**
County: **Rockland** State: **NY**

Station: **PASC_01**
Collection Date: **8/11/2011**

Order	Family	Genus/species	Total #	
COLEOPTERA	Elmidae	Stenelmis sp.	1	
DECAPODA	Cambaridae	Orconectes sp.	2	
DIPTERA	Chironomidae	Dicrotendipes sp.	1	
		Thienemannimyia gr. spp.	1	
		Brillia sp.	1	
		Micropsectra sp.	1	
		Parametriocnemus sp.	1	
		Tanytarsus sp.	2	
		Polypedilum flavum	35	
		Diamesa sp.	1	
		Tipulidae	Antocha sp.	1
		HOPLONEMERTEA	Tetrastemmatidae	Prostoma graecense
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	24	
		Hydropsyche sparna	20	
		Hydropsyche bronta	7	
		Philopotamidae	Chimarra sp.	1

Field Data Summary

Waterbody: **Pascack Brook**
 River Basin: **Hackensack**
 County: **Rockland**
 State: **NY**

Station: **PASC 02**
 Coll Date: **8/11/2011**
 Site description: **Just below Blue Heron Rd bridge**

Latitude: **41.0949**
 Longitude: **-74.0325**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	5
Current (cm/sec):	85
Canopy (%):	75
Substrate	
Rock (%):	
Rubble (%):	30
Gravel (%):	20
Sand (%):	30
Silt (%):	20
Embeddedness (%):	75

Chemical Measurements	
DO (mg/L):	6.88
DO sat. (%):	77.3
Temperature (C):	20.96
Spec. Conduct. (umhos):	595
Baro pressure:	749.5
pH:	7.65
Salinity (PSS):	0.29

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Pascack Brook**
County: **Rockland** State: **NY**

Station: **PASC_02**
Collection Date: **8/11/2011**

Order	Family	Genus/species	Total #	
COLEOPTERA	Elmidae	Stenelmis sp.	1	
DECAPODA	Cambaridae	Orconectes sp.	1	
DIPTERA	Chironomidae	Thienemannimyia gr. spp.	1	
		Cardiocladius obscurus	1	
		Tanytarsus sp.	1	
		Polypedilum flavum	30	
		Cricotopus trifascia gr.	2	
		Empididae	Undetermined Empididae	1
		Tipulidae	Antocha sp.	1
EPHEMEROPTERA	Baetidae	Baetis intercalaris	3	
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	33	
		Hydropsyche bronta	7	
		Hydropsyche betteni	17	
TRICLADIDA		Undetermined Turbellaria	1	

Field Data Summary

Waterbody: **Pascack Brook**
 River Basin: **Hackensack**
 County: **Rockland**
 State: **NY**

Station: **PASC 03**
 Coll Date: **8/11/2011**
 Site description: **At the end of Shear Court**

Latitude: **41.1092**
 Longitude: **-74.0316**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	2.5
Current (cm/sec):	45
Canopy (%):	90
Substrate	
Rock (%):	5
Rubble (%):	20
Gravel (%):	20
Sand (%):	45
Silt (%):	10
Embeddedness (%):	60
Chemical Measurements	
DO (mg/L):	7.41
DO sat. (%):	80.9
Temperature (C):	19.58
Spec. Conduct. (umhos):	580
Baro pressure:	748.4
pH:	7.99
Salinity (PSS):	0.28
Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	Diptera
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Pascack Brook**
County: **Rockland** State: **NY**

Station: **PASC_03**
Collection Date: **8/11/2011**

Order	Family	Genus/species	Total #		
ARHYNCHOBDELLID	Erpobdellidae	Undetermined Erpobdellidae	1		
BASOMMATOPHOR	Physidae	Physella sp.	2		
DECAPODA	Cambaridae	Orconectes sp.	1		
DIPTERA	Chironomidae	Polypedilum illinoense	1		
		Parametrioconemus sp.	3		
		Cryptochironomus sp.	1		
		Tanytarsus sp.	3		
		Thienemannimyia gr. spp.	5		
		Polypedilum flavum	5		
		Empididae	Hemerodromia sp.	8	
		Tipulidae	Tipula sp.	1	
		ISOPODA	Asellidae	Caecidotea sp.	1
		ODONATA	Calopterygidae	Calopteryx sp.	1
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	40		
		Hydropsyche betteni	25		
		Philopotamidae	Chimarra sp.	1	
TRICLADIDA		Undetermined Turbellaria	1		

Field Data Summary

Waterbody: **Upper Saddle Brook**
 River Basin: **Upper Saddle**
 County: **Rockland**
 State: **NY**

Station: **SADL 03**
 Coll Date: **8/11/2011**
 Site description: **Just off Cherry Lane**

Latitude: **41.0866**
 Longitude: **-74.0938**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	3
Current (cm/sec):	60
Canopy (%):	90
Substrate	
Rock (%):	10
Rubble (%):	25
Gravel (%):	25
Sand (%):	30
Silt (%):	10
Embeddedness (%):	30

Chemical Measurements	
DO (mg/L):	8.21
DO sat. (%):	88.2
Temperature (C):	18.72
Spec. Conduct. (umhos):	506
Baro pressure:	749.6
pH:	7.8
Salinity (PSS):	0.24

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	Y
Megaloptera:	
Odonata:	Y
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Upper Saddle Brook**

Station: **SADL_03**

County: **Rockland** State: **NY**

Collection Date: **8/11/2011**

Order	Family	Genus/species	Total #	
COLEOPTERA	Elmidae	Stenelmis sp.	5	
	Psephenidae	Psephenus herricki	1	
DECAPODA	Cambaridae	Orconectes sp.	1	
DIPTERA	Chironomidae	Thienemannimyia gr. spp.	6	
		Polypedilum aviceps	25	
		Tanytarsus sp.	2	
		Diamesa sp.	1	
		Polypedilum flavum	9	
		Tvetenia sp.	2	
		Empididae	Hemerodromia sp.	2
		EPHEMEROPTERA	Baetidae	Baetis intercalaris
MEGALOPTERA	Corydalidae	Corydalus cornutus	1	
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	18	
		Hydropsyche sparna	7	
		Hydropsyche betteni	3	
		Philopotamidae	Chimarra aterrima?	15
			Dolophilodes sp.	1

Field Data Summary

Waterbody: **Muddy Creek**
 River Basin: **Hackensack**
 County: **Rockland**
 State: **NY**

Station: **MUDD 02**
 Coll Date: **8/11/2011**
 Site description: **Just below East Washington Ave**

Latitude: **41.0600**
 Longitude: **-74.0235**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	2.5
Current (cm/sec):	45
Canopy (%):	10
Substrate	
Rock (%):	
Rubble (%):	20
Gravel (%):	25
Sand (%):	25
Silt (%):	30
Embeddedness (%):	60

Chemical Measurements	
DO (mg/L):	6.6
DO sat. (%):	72.4
Temperature (C):	19.78
Spec. Conduct. (umhos):	808
Baro pressure:	752.1
pH:	7.36
Salinity (PSS):	0.40

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	Y
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	
Simuliidae:	
Decapoda:	Y
Gammaridae:	Y
Mollusca:	
Oligochaeta:	
Other macro's:	Sowbugs
Field Faunal Condition:	Poor

Flow
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Flow



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Muddy Creek**

Station: **MUDD_02**

County: **Rockland** State: **NY**

Collection Date: **8/11/2011**

Order	Family	Genus/species	Total #
AMPHIPODA	Gammaridae	Gammarus sp.	22
COLEOPTERA	Elmidae	Stenelmis sp.	25
DIPTERA	Chironomidae	Polypedilum aviceps	1
		Microtendipes pedellus gr.	4
		Chaetocladius sp.	1
		Thienemannimyia gr. spp.	4
		Cricotopus/Orthocladius Complex	2
		Tanytarsus sp.	1
		Chironomus sp.	1
		EPHEMEROPTERA	Baetidae
ISOPODA	Asellidae	Caecidotea sp.	18
TRICHOPTERA	Hydropsychidae	Hydropsyche betteni	4
		Cheumatopsyche sp.	10
VENEROIDEA	Sphaeriidae	Pisidium sp.	4

Field Data Summary

Waterbody: **Ramapo River**
 River Basin: **Ramapo**
 County: **Rockland**
 State: **NY**

Station: **RAMA 07**
 Coll Date: **8/12/2011**
 Site description: **Just above 4th St bridge**

Latitude: **41.1252**
 Longitude: **-74.1646**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	20
Current (cm/sec):	100
Canopy (%):	40
Substrate	
Rock (%):	
Rubble (%):	30
Gravel (%):	30
Sand (%):	30
Silt (%):	10
Embeddedness (%):	40

Chemical Measurements	
DO (mg/L):	8.18
DO sat. (%):	89.5
Temperature (C):	19.96
Spec. Conduct. (umhos):	324
Baro pressure:	756.1
pH:	7.56
Salinity (PSS):	0.15

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	Y
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	Y
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Very good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Ramapo River**

Station: **RAMA_07**

County: **Rockland** State: **NY**

Collection Date: **8/12/2011**

Order	Family	Genus/species	Total #
COLEOPTERA	Elmidae	Optioservus sp.	5
		Stenelmis sp.	3
DIPTERA	Psephenidae	Psephenus herricki	1
	Chironomidae	Cardiocladius obscurus	1
	Simuliidae	Simulium sp.	3
EPHEMEROPTERA	Baetidae	Baetis intercalaris	2
		Stenonema modestum	1
	Isonychiidae	Leucrocuta sp.	1
		Epeorus sp.	1
		Isonychia sp.	27
PLECOPTERA	Perlidae	Acroneuria abnormis	1
		Paragnetina media	2
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	32
		Hydropsyche bronta	18
		Hydropsyche sparna	1
TRICLADIDA		Undetermined Turbellaria	1

Field Data Summary

Waterbody: **Unnamed Trib**
 River Basin: **Ramapo**
 County: **Rockland**
 State: **NY**

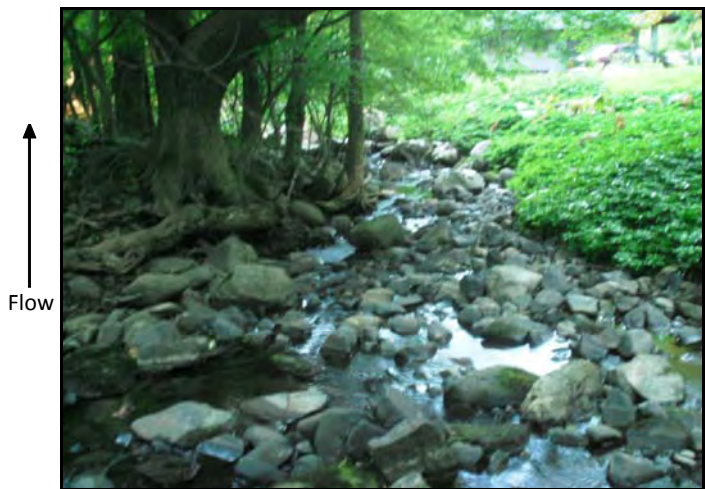
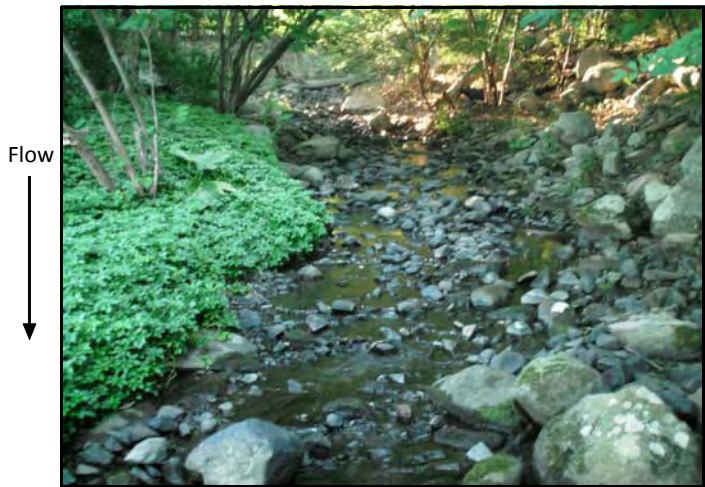
Station: **MAWA 1TA**
 Coll Date: **8/12/2011**
 Site description: **Just above Haverstraw Rd**

Latitude: **41.1818**
 Longitude: **-74.0691**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.1
Width (meters):	1.5
Current (cm/sec):	45
Canopy (%):	80
Substrate	
Rock (%):	15
Rubble (%):	30
Gravel (%):	30
Sand (%):	15
Silt (%):	10
Embeddedness (%):	25

Chemical Measurements	
DO (mg/L):	7.1
DO sat. (%):	75.1
Temperature (C):	17.91
Spec. Conduct. (umhos):	629
Baro pressure:	750.6
pH:	7.84
Salinity (PSS):	0.31

Biological Attributes	
Aquatic vegetation	
Macrophytes:	Y
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	
Plecoptera:	
Trichoptera:	Y
Coleoptera:	Y
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Poor



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Mawah River**

Station: **MAWA_1TA**

County: **Rockland** State: **NY**

Collection Date: **8/12/2011**

Order	Family	Genus/species	Total #
COLEOPTERA	Elmidae	Stenelmis sp.	5
	Psephenidae	Ectopria sp.	1
DECAPODA	Cambaridae	Orconectes sp.	1
DIPTERA	Chironomidae	Diamesa sp.	3
		Thienemannimyia gr. spp.	1
		Polypedilum illinoense	1
	Simuliidae	Simulium sp.	1
	EPHEMEROPTERA	Baetidae	Baetis intercalaris
ISOPODA	Asellidae	Caecidotea sp.	1
MEGALOPTERA	Corydalidae	Nigronia serricornis	1
PLECOPTERA	Chloroperlidae	Sweltsa sp.	1
TRICHOPTERA	Glossosomatidae	Glossosoma sp.	1
		Hydropsychidae	Diplectrona sp.
		Cheumatopsyche sp.	12
		Hydropsyche betteni	5
	Philopotamidae	Chimarra aterrima?	30

Field Data Summary

Waterbody: **Unnamed Trib**
 River Basin: **Ramapo**
 County: **Rockland**
 State: **NY**

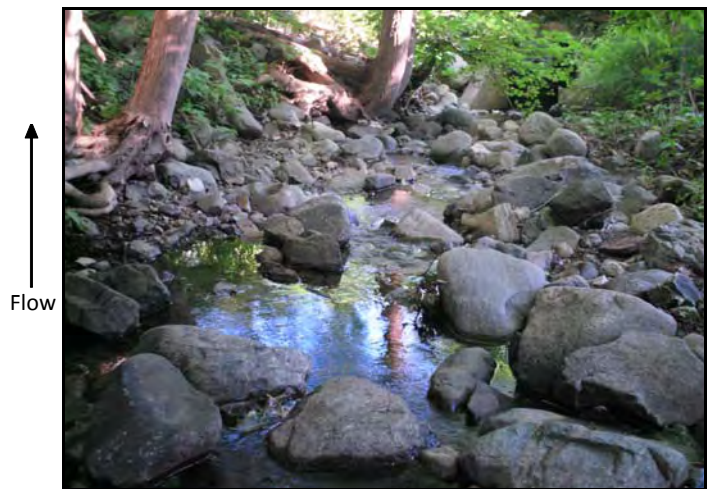
Station: **MAWA 1TB**
 Coll Date: **8/12/2011**
 Site description: **Just above Haverstraw Rd**

Latitude: **41.1707**
 Longitude: **-74.0851**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	1.5
Current (cm/sec):	50
Canopy (%):	85
Substrate	
Rock (%):	25
Rubble (%):	25
Gravel (%):	25
Sand (%):	15
Silt (%):	10
Embeddedness (%):	25

Chemical Measurements	
DO (mg/L):	7.74
DO sat. (%):	79.8
Temperature (C):	16.76
Spec. Conduct. (umhos):	562
Baro pressure:	751
pH:	7.75
Salinity (PSS):	0.27

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Un-named Trib to Mawah Ri**
County: **Rockland** State: **NY**

Station: **MAWA_1TB**
Collection Date: **8/12/2011**

Order	Family	Genus/species	Total #	
COLEOPTERA	Elmidae	Stenelmis sp.	4	
DECAPODA	Cambaridae	Cambarus sp.	1	
DIPTERA	Chironomidae	Parametricnemus sp.	2	
		Polypedilum aviceps	4	
		Diamesa sp.	1	
		Thienemannimyia gr. spp.	3	
		Simuliidae	Simulium sp.	2
		Tipulidae	Tipula sp.	1
		EPHEMEROPTERA	Baetidae	Baetis intercalaris
ISOPODA	Asellidae	Caecidotea sp.	9	
LUMBRICIDA	Lumbricina	Undetermined Lumbricina	2	
MEGALOPTERA	Corydalidae	Nigronia serricornis	10	
PLECOPTERA	Leuctridae	Leuctra sp.	13	
TRICHOPTERA	Hydropsychidae	Diplectrona sp.	22	
		Hydropsyche betteni	8	
		Cheumatopsyche sp.	6	
		Philopotamidae	Chimarra aterrima?	10

Field Data Summary

Waterbody: **Mahwah River**
 River Basin: **Ramapo**
 County: **Rockland**
 State: **NY**

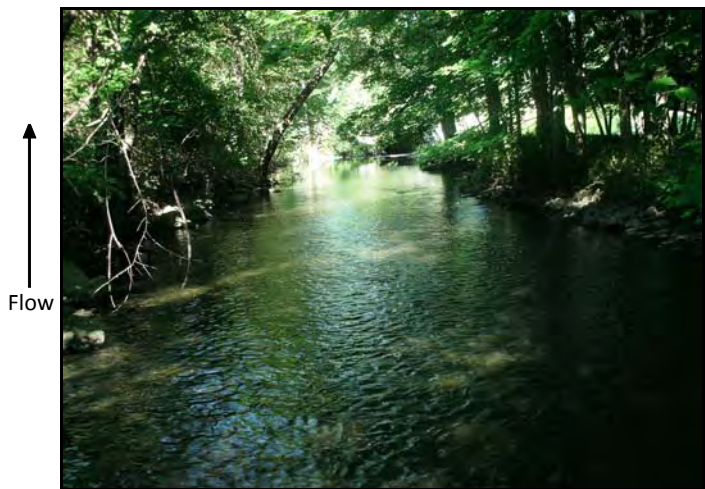
Station: **MAWA 01**
 Coll Date: **8/12/2011**
 Site description: **Just off Montebello Rd**

Latitude: **41.1240**
 Longitude: **-74.1353**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.2
Width (meters):	12
Current (cm/sec):	70
Canopy (%):	80
Substrate	
Rock (%):	
Rubble (%):	30
Gravel (%):	30
Sand (%):	25
Silt (%):	15
Embeddedness (%):	40

Chemical Measurements	
DO (mg/L):	7.55
DO sat. (%):	80.9
Temperature (C):	18.55
Spec. Conduct. (umhos):	750
Baro pressure:	765
pH:	7.93
Salinity (PSS):	0.36

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	
Trichoptera:	Y
Coleoptera:	
Megaloptera:	Y
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	Y
Mollusca:	
Oligochaeta:	Y
Other macro's:	
Field Faunal Condition:	Good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Mahwah River**
County: **Rockland** State: **NY**

Station: **MAWA_01**
Collection Date: **8/12/2011**

Order	Family	Genus/species	Total #
AMPHIPODA	Gammaridae	Gammarus sp.	24
COLEOPTERA	Elmidae	Optioservus sp.	8
		Stenelmis sp.	27
DIPTERA	Psephenidae	Psephenus herricki	2
	Chironomidae	Rheotanytarsus sp.	1
		Thienemannimyia gr. spp.	1
		Polypedilum flavum	4
	Empididae	Hemerodromia sp.	1
EPHEMEROPTERA	Baetidae	Baetis intercalaris	6
	Heptageniidae	Stenonema sp.	4
	Isonychiidae	Isonychia sp.	1
MEGALOPTERA	Corydalidae	Corydalus cornutus	2
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	9
	Philopotamidae	Chimarra aterrima?	2
VENEROIDEA	Sphaeriidae	Sphaerium sp.	6
		Pisidium sp.	2

Field Data Summary

Waterbody: **Mahwah River**
 River Basin: **Ramapo**
 County: **Rockland**
 State: **NY**

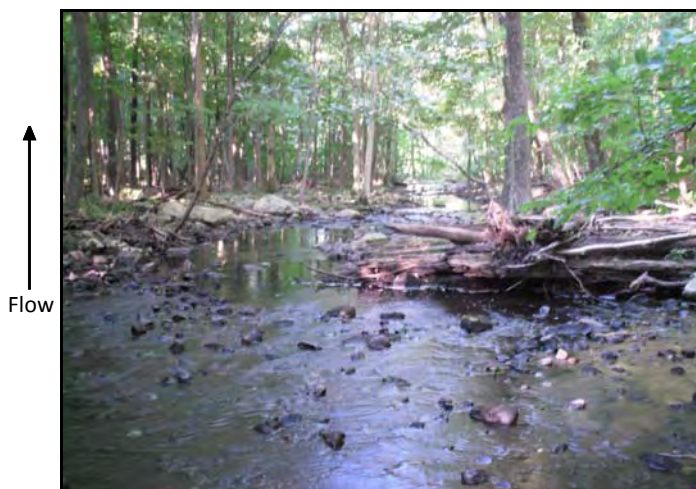
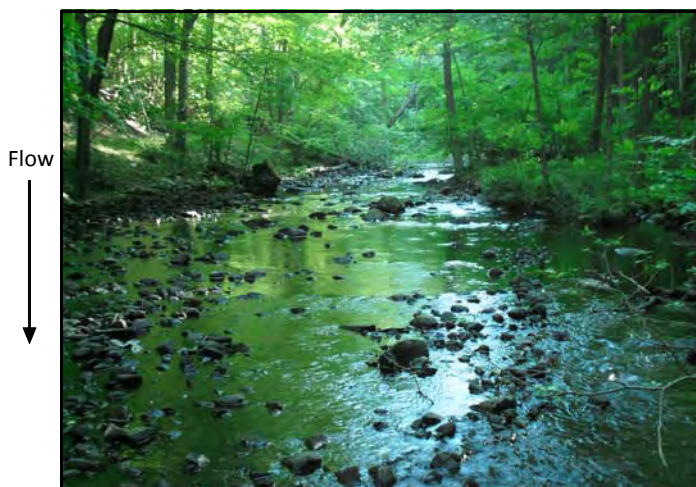
Station: **MAWA 02**
 Coll Date: **8/12/2011**
 Site description: **Just off Haverstraw Rd**

Latitude: **41.1685**
 Longitude: **-74.0913**
 Field Crew: **jkn**

Physical Characteristics	
Depth (meters):	0.15
Width (meters):	7
Current (cm/sec):	60
Canopy (%):	95
Substrate	
Rock (%):	5
Rubble (%):	40
Gravel (%):	25
Sand (%):	20
Silt (%):	10
Embeddedness (%):	30

Chemical Measurements	
DO (mg/L):	5.22
DO sat. (%):	57.1
Temperature (C):	19.75
Spec. Conduct. (umhos):	173
Baro pressure:	752.4
pH:	6.95
Salinity (PSS):	0.08

Biological Attributes	
Aquatic vegetation	
Macrophytes:	
Diatoms:	Y
Algae-suspended:	
Algae-filamentous:	
Occurance of macroinvertebrates	
Ephemeroptera:	Y
Plecoptera:	Y
Trichoptera:	Y
Coleoptera:	Y
Megaloptera:	Y
Odonata:	
Chironomidae:	Y
Simuliidae:	
Decapoda:	Y
Gammaridae:	
Mollusca:	
Oligochaeta:	
Other macro's:	
Field Faunal Condition:	Very good



Benthic Macroinvertebrate Lab Data Summary

Waterbody: **Mahwah River**
County: **Rockland** State: **NY**

Station: **MAWA_02**
Collection Date: **8/12/2011**

Order	Family	Genus/species	Total #
AMPHIPODA	Gammaridae	Gammarus sp.	1
COLEOPTERA	Elmidae	Stenelmis sp.	17
	Psephenidae	Psephenus herricki	2
DIPTERA	Chironomidae	Thienemannimyia gr. spp.	4
		Diamesa sp.	1
		Rheotanytarsus sp.	1
	Empididae	Hemerodromia sp.	1
	Simuliidae	Simulium sp.	3
	EPHEMEROPTERA	Heptageniidae	Stenonema terminatum
Stenonema sp.			7
Isonychiidae		Isonychia sp.	3
ISOPODA		Asellidae	Caecidotea sp.
MEGALOPTERA	Corydalidae	Nigronia serricornis	2
PLECOPTERA	Leuctridae	Leuctra sp.	2
TRICHOPTERA	Hydropsychidae	Diplectrona sp.	1
		Cheumatopsyche sp.	27
		Hydropsyche betteni	11
	Philopotamidae	Chimarra aterrima?	14