

**BENTHIC COMMUNITY CONDITION AT
AMBIENT TOXICITY PROGRAM SITES
2001**

Prepared for

Maryland Department of Natural Resources
Tidewater Ecosystem Assessments
Annapolis, Maryland

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May 2002

FOREWORD

This document, *Benthic Community Condition at Ambient Toxicity Program Sites, 2001*, was prepared by Versar, Inc. at the request of Mr. Bruce Michael of the Maryland Department of Natural Resources under Cooperative Agreement CA-02-01/07-4-30722-3734 between Versar, Inc., and the University of Maryland Center for Environmental and Estuarine Studies. The report assesses the status of Chesapeake Bay benthic communities at sites in four Maryland eastern shore tributaries.

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1.0 INTRODUCTION

In September 2001, the Maryland Department of Natural Resources conducted a study to assess water quality, sediment quality, and the quality of biological resources at 20 sites in the tidal Chesapeake Bay. These sites were located in four tributaries of the eastern shore of Maryland: Wye River, Wicomico River, Manokin River, and Big Annemessex River. Water quality, sediment chemistry, sediment toxicity, and benthic invertebrate data were collected at each site. This document presents the results of the benthic portion of the study.

2.0 METHODS

2.1 SAMPLE COLLECTION

Benthic samples for the Ambient Toxicity study were collected at twenty sites on 26 to 28 September 2001. Five sites were sampled in the mesohaline portion of each tributary. Sampling locations are provided in Table 2-1 and Figures 2-1 and 2-2.

Table 2-1. Sampling locations. NAD83 datum.			
Tributary	Station	Latitude	Longitude
Wye River	WY-112	38.8807733	76.1585083
	WY-125	38.8537533	76.1840450
	WY-127	38.8607667	76.1878800
	WY-152	38.9246883	76.1665317
	WY-153	38.9279333	76.1663083
Wicomico River	WI-01	38.2408983	75.8627217
	WI-02	38.2436567	75.8473050
	WI-04	38.2536133	75.8173483
	WI-06	38.2622867	75.7960633
	WI-07	38.2680733	75.7842383
Manokin River	MA-02	38.1358567	75.8025950
	MA-04	38.1362000	75.7828717
	MA-05	38.1466600	75.7913417
	MA-07	38.1571667	75.7753000
	MA-10	38.1646500	75.7468167
Big Annemessex River	BA-02	38.0901217	75.7534067
	BA-05	38.0950833	75.7703350
	BA-07	38.0877717	75.7796567
	BA-09	38.0867800	75.7908683
	BA-10	38.0761617	75.7851300

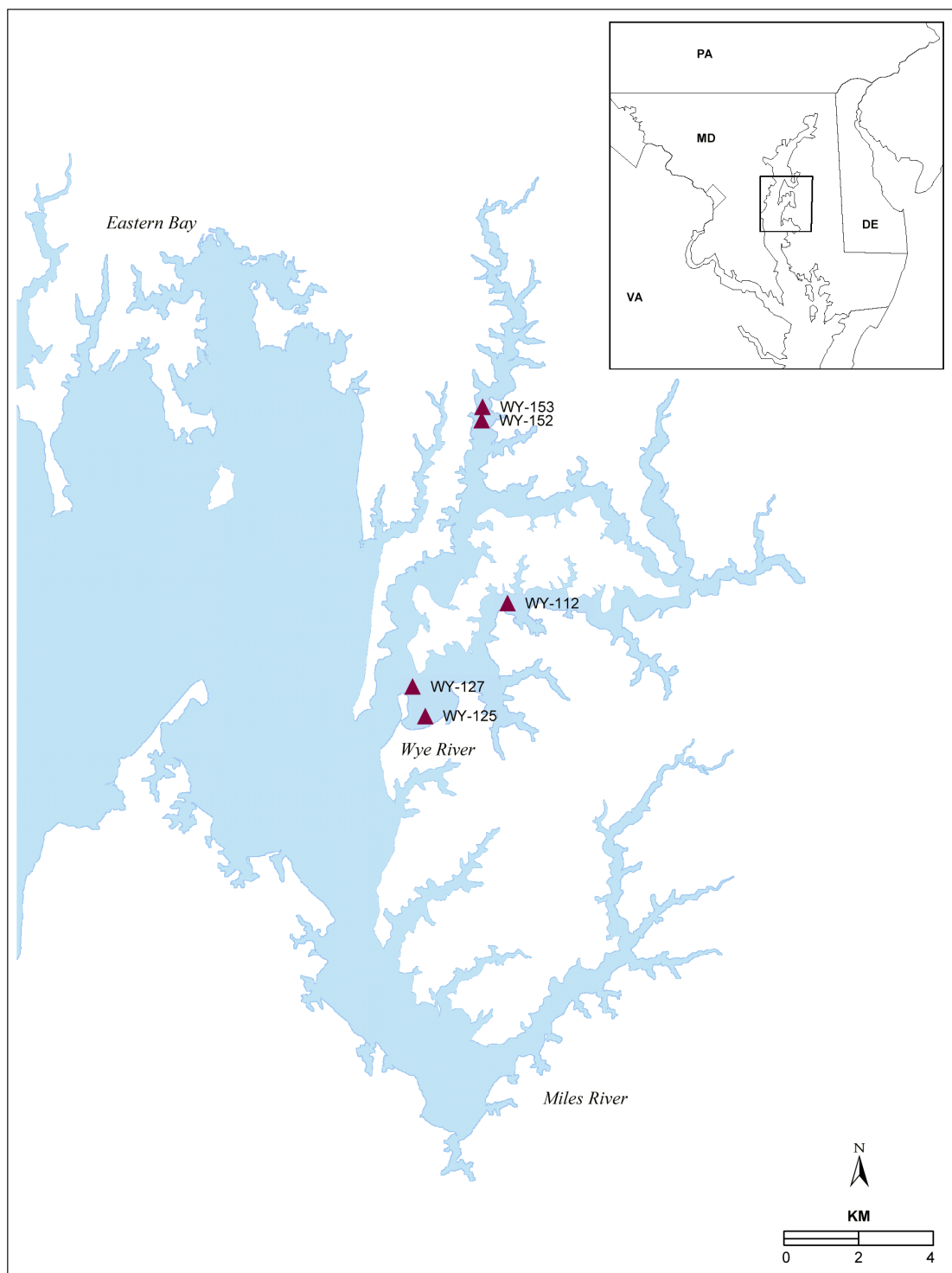


Figure 2-1. 2001 Ambient Toxicity Program sampling locations in the Wye River.

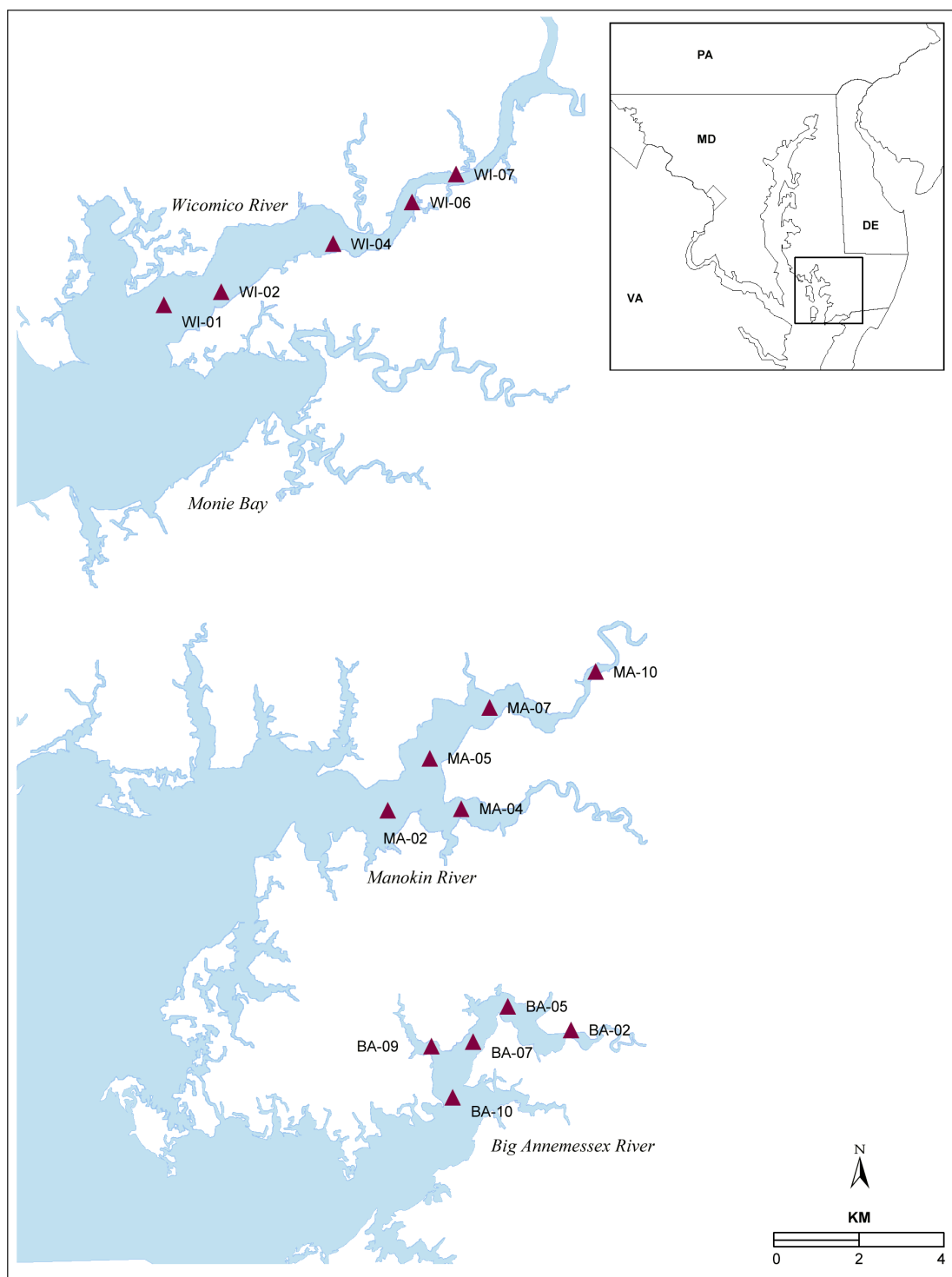


Figure 2-2. 2001 Ambient Toxicity Program sampling locations in the Wicomico, Manokin, and Big Annemessex Rivers.

Benthic samples were collected with a Young Grab, which samples an area of 440 cm² to a depth of 10 cm. One benthic grab sample was collected at each site and all samples were sieved through a 0.5-mm screen using an elutriative process. Organisms retained on the screen were transferred to labeled jars and preserved in 10% buffered formalin stained with Rose Bengal (a vital stain used to aid separation of organisms from sediment and detritus). One additional grab sample was collected from each site for percent silt/clay and total organic carbon (TOC) analysis of sediments. Two surficial sediment samples (approximately 120 ml each) from this grab were frozen until processed in the laboratory. Bottom water temperature, conductivity, salinity, dissolved oxygen concentration (DO), and pH were measured at each site with a Hydrolab DataSonde 3 unit.

2.2 LABORATORY PROCESSING

Organisms were sorted from detritus under dissecting microscopes, transferred to 70% ethanol, identified to the lowest practical taxonomic level, and counted. Ash-free dry weight biomass was measured for each species by drying the organisms to a constant weight at 60 °C followed by ashing in a muffle furnace at 500 °C for four hours.

Oligochaetes and chironomid midges were mounted on microscope slides, examined under a compound microscope, and identified to genus and species following procedures based upon currently accepted practices in benthic ecology. The protocol is as follows. If the number of oligochaetes or chironomids in a sample is over 20 individuals, the sample is split and 50% of the specimens are mounted. The remaining portion is saved and used for biomass determinations. The sample is split by evenly spreading the specimens in a gridded tray and selecting half of the total number of grids at random. Total taxonomic counts for each oligochaete or chironomid species are adjusted by the proportion of the total number of specimens mounted in the sample. Total oligochaete or chironomid biomass is estimated by weighing the unmounted specimens and multiplying by 2. Because most species of oligochaetes and chironomids need to be slide-mounted for identification, species-specific biomass cannot be provided except for *Tubificoides* spp. and *Coelotanypus* spp., which do not need slide mounting for identification.

Sand and silt-clay particles were separated by wet-sieving through a 63μ stainless steel sieve and weighed using the procedures described by Plumb (1981) and Buchanan (1984). Total organic carbon (TOC) was analyzed on an Exeter Analytical Inc., Model CE-440 Analyzer by the Analytical Services Department of Chesapeake Biological Laboratory. The TOC is determined by performing separate total carbon (TC) and total inorganic carbon analyses (TIC) and subtracting the results. TC is analyzed by high temperature combustion and subsequent measurement of the carbon dioxide produced by thermal conductivity detection. TIC is analyzed by first ashing the sample in a muffle furnace at low temperature to remove the organic carbon, and then applying high temperature combustion to the remaining inorganic carbon in the ash.

2.3 DATA ANALYSIS

Analyses were performed in the context of the Chesapeake Bay Program Benthic Community Restoration Goals, which use the Benthic Index of Biotic Integrity (B-IBI) to measure goal attainment. The Chesapeake Bay B-IBI is described in Weisberg et al (1997) and Alden et al. (2002). A detailed account of the procedures used in the calculation of the B-IBI can be found on the World Wide Web at the following address:

<http://www.baybenthos.versar.com/results/sampback.htm>.

2.3.1 The B-IBI and the Chesapeake Bay Benthic Community Restoration Goals

The B-IBI is a multiple-attribute index developed to identify the degree to which a benthic assemblage meets the Chesapeake Bay Program Benthic Community Restoration Goals. The Restoration Goals are quantitative thresholds based on reference data distributions (Weisberg et al. 1997). The B-IBI provides a means for comparing the relative condition of benthic invertebrate assemblages across different habitats. It also provides a validated mechanism for integrating several benthic community attributes indicative of "health" into a single number that measures overall benthic community condition.

The B-IBI is scaled from 1 to 5. Sites with values of 3.0 or more are considered to meet the Restoration Goals. The index is calculated by scoring each of several attributes as either 5, 3, or 1 depending on whether the value of the attribute approximates, deviates slightly from, or deviates strongly from values at the best reference sites in similar habitats, and then averaging these scores across attributes. The criteria for assigning these scores are numeric and habitat-dependent.

Benthic community condition was classified into four levels based on the B-IBI. Values less than or equal to 2.0 were classified as severely degraded; values from 2.0 to 2.6 were classified as degraded; values between 2.7 and 3.0 were classified as marginal, and values of 3.0 or more were classified as meeting the goals.

3.0 RESULTS

For each of the 2001 Ambient Toxicity Program sites, B-IBI values and the corresponding benthic community condition are presented in Table 3-1 and Figures 3-1 and 3-2. Station-specific water quality measurements and sediment composition are provided in Table 3-2. Details of the water quality measurements, sediment composition, species abundance and biomass, and metric scores are provided in the Appendix.

Table 3-1. B-IBI values and benthic community condition at 2001 Ambient Toxicity Program sites.				
Tributary	Station	B-IBI Value	Benthic Community Condition	Metrics Scoring 1
Wye River	WY-112	4.3	Meets Goal	none
	WY-125	3.7	Meets Goal	none
	WY-127	1.0	Severely Degraded	All metrics
	WY-152	4.0	Meets Goal	none
	WY-153	4.0	Meets Goal	none
Wicomico River	WI-01	2.7	Marginal	Pollution-sensitive sp. biomass
	WI-02	3.4	Meets Goal	Pollution-sensitive sp. biomass
	WI-04	3.0	Meets Goal	Total biomass, pollution-indicative sp. abundance
	WI-06	4.6	Meets Goal	none
	WI-07	2.6	Degraded	Total biomass, pollution-indicative sp. abundance
Manokin River	MA-02	3.3	Meets Goal	Pollution-sensitive sp. biomass
	MA-04	4.0	Meets Goal	none
	MA-05	3.3	Meets Goal	Total abundance
	MA-07	3.0	Meets Goal	Diversity, Carnivore/Omnivore abundance
	MA-10	3.8	Meets Goal	none
Big Annemessex River	BA-02	2.7	Marginal	Diversity, Total abundance, Carnivore/Omnivore abundance
	BA-05	3.7	Meets Goal	Pollution-sensitive sp. biomass
	BA-07	3.0	Meets Goal	Pollution-sensitive sp. biomass
	BA-09	3.7	Meets Goal	none
	BA-10	3.7	Meets Goal	none

For all sites, salinity was in the low (5-12 psu) or high (12-18 psu) mesohaline range (Table 3-2). Bottom water temperature was typical of late summer conditions in shallow water tributaries of the Chesapeake Bay, fluctuating between 20 and 23 °C. Dissolved oxygen concentrations in the water column indicated oxygen saturated or super-saturated conditions. Total organic carbon in sediments ranged from 1.1 % at Station 5 in the Manokin River to 4.7 at Station 2 in the Big Annemessex River, with no indication of organic enrichment being a problem. Except for the Manokin River (Stations 5 and 10), the substrate was muddy (> 40% silt/clay).

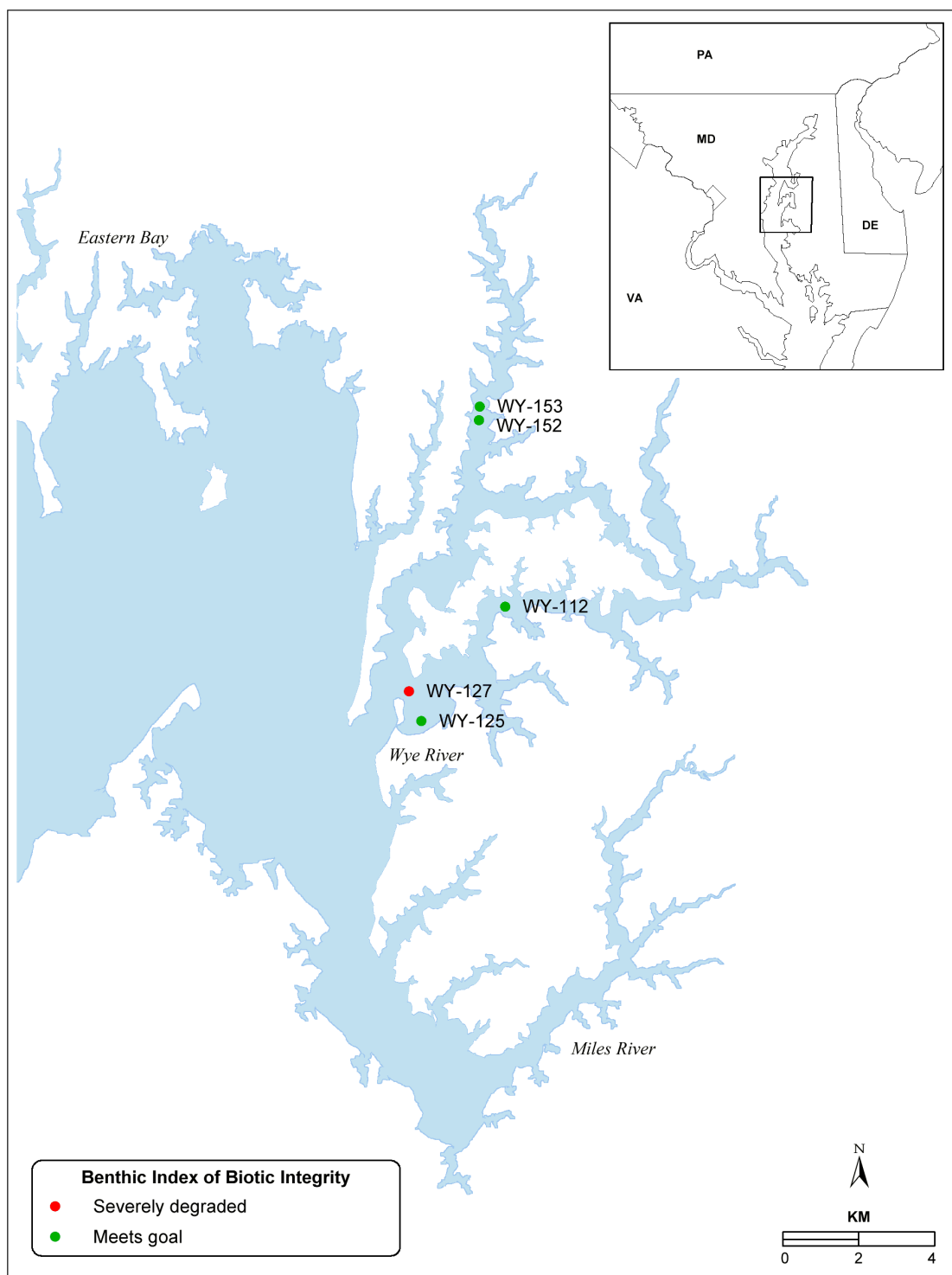


Figure 3-1. Benthic community condition at the 2001 Ambient Toxicity Program sites in the Wye River.

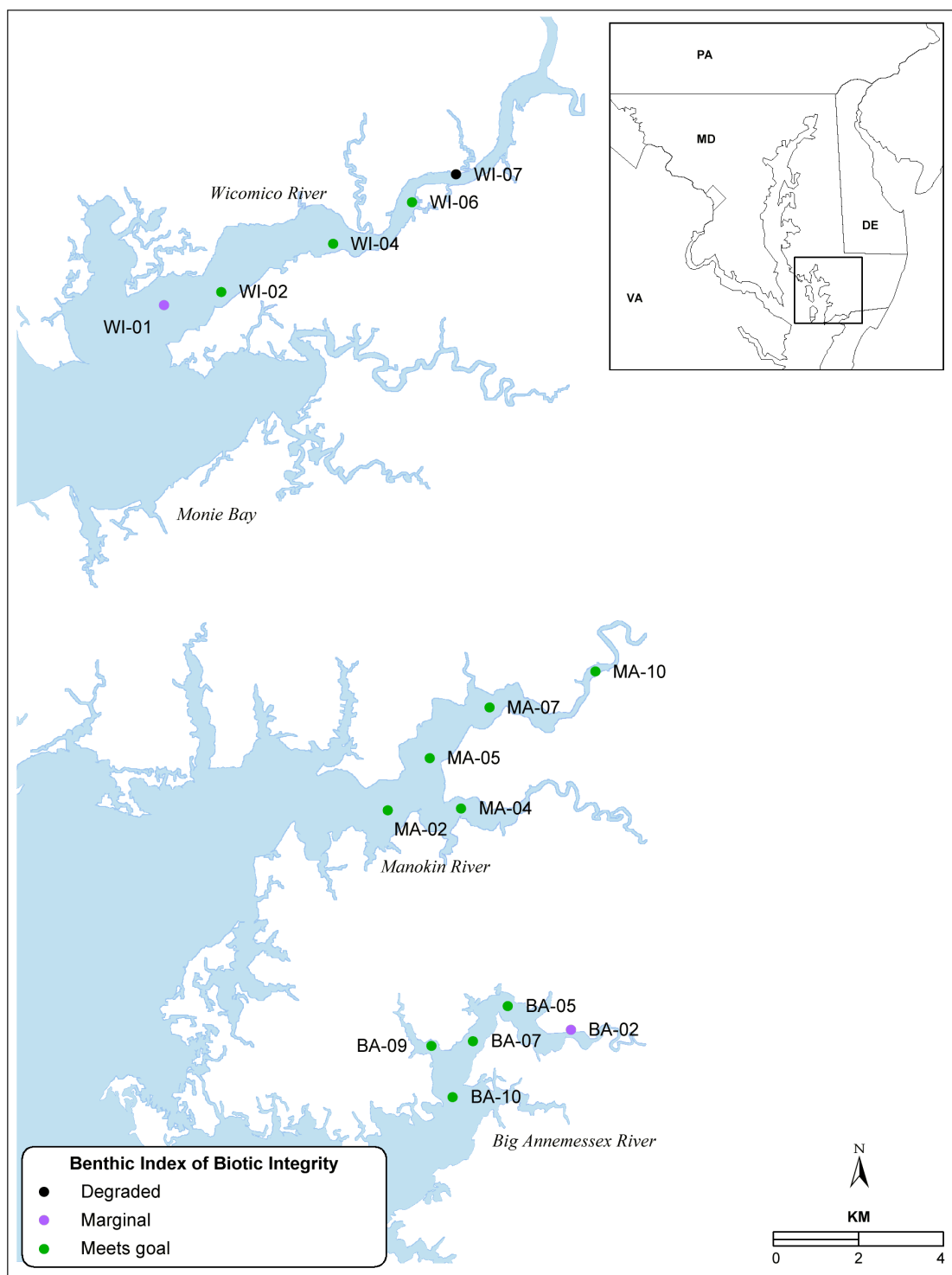


Figure 3-2. Benthic community condition at 2001 Ambient Toxicity Program sites in the Wicomico, Manokin, and Bay Annemessex Rivers.

Table 3-2. Site-specific water quality measurements near the bottom and sediment composition.								
Station	Sampling Date	Depth (m)	Salinity (psu)	Temperature (°C)	Dissolved Oxygen (mg/l)	pH	Silt/clay (%)	TOC (%)
WY-112	9/26/01	4.5	13.32	23.01	6.91	7.61	59.00	2.44
WY-125	9/26/01	4.9	13.80	21.14	8.21	7.74	64.76	1.47
WY-127	9/26/01	7.6	14.34	22.77	6.91	7.59	63.51	2.25
WY-152	9/26/01	3.1	12.62	23.09	6.34	7.55	84.63	2.58
WY-153	9/26/01	5.3	12.15	22.20	7.14	7.63	83.79	2.69
WI-01	9/26/01	2.6	12.15	22.09	8.92	7.62	85.68	2.71
WI-02	9/26/01	2.6	11.79	22.20	8.99	7.61	65.81	2.46
WI-04	9/26/01	1.5	9.24	22.71	7.38	7.25	47.73	1.70
WI-06	9/26/01	1.5	8.09	23.07	7.18	7.21	44.63	2.36
WI-07	9/26/01	3.0	6.86	22.99	5.99	7.14	76.94	3.43
MA-02	9/27/01	2.1	14.94	21.39	9.87	7.95	67.70	2.17
MA-04	9/27/01	1.2	13.84	21.54	9.70	7.87	65.55	2.57
MA-05	9/27/01	1.2	14.20	21.34	9.29	7.89	30.01	1.08
MA-07	9/28/01	2.1	13.41	20.22	9.35	7.74	72.54	4.45
MA-10	9/28/01	2.0	10.88	20.75	9.07	7.46	30.92	2.74
BA-02	9/27/01	1.2	14.68	19.88	8.82	7.67	76.91	4.71
BA-05	9/27/01	1.2	15.78	20.64	8.58	7.76	79.77	2.89
BA-07	9/27/01	1.8	16.06	20.76	8.73	7.82	67.53	2.88
BA-09	9/27/01	1.2	16.08	20.65	9.13	7.86	50.31	2.06
BA-10	9/27/01	2.4	16.47	20.85	8.97	7.88	63.14	2.89

Sixteen sites met the Benthic Community Restoration Goals for Chesapeake Bay and four sites failed the goals (Table 3-1, Figure 3-1). Of the four sites that failed, two were classified as marginally degraded, one was classified as degraded, and one was classified as severely degraded.

Benthic community condition in the Wye River was best overall, except for Site 127, which was severely degraded (Table 3-1). All benthic community attributes at this site indicated severe impairment. Site 127 had few species and the community was numerically dominated by the opportunist polychaete annelid *Streblospio benedicti* (see Appendix). Some community attributes at sites in the Manokin River were below Chesapeake Bay reference values; however, the B-IBI indicated good benthic community condition at all sites in this tributary. Two sites in the Wicomico River failed the B-IBI, but these sites were only marginally or moderately degraded, within the range of error typically associated with the B-IBI. Likewise, one site failing the B-IBI in the Big Annemessex River was only marginally degraded. This last site (Site BA-02) indicated over-abundance with numerical dominance of

the oligochaete annelid *Tubificoides* sp. While excess abundance of *Tubificoides* may be indicative of organic pollution, this small organism is usually found in high numbers in natural situations near marshes and small creeks.

Overall, and except for Site 127 in the Wye River, benthic community condition in the mesohaline portion of the Maryland eastern shore tributaries here studied was good indicative of good sediment quality. No interpretation is possible with these data as to the causes of severe impairment at Site 127.

4.0 REFERENCES

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APPENDIX

**WATER QUALITY MEASUREMENTS, SEDIMENT COMPOSITION,
SPECIES ABUNDANCES, SPECIES BIOMASS,
B-IBI VALUES, AND METRIC SCORES FOR EACH SITE**

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
 AMBIENT TOXICITY STATIONS

Watershed: Big Annemessex River		Station: BA-02		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 27SEP01	
		Sampled Area: 0.044 sq.m		Time: 10:06:33	
BOTTOM ENVIRONMENT					
Depth (m): 1.2		Salinity (ppt): 14.68		Temperature (C): 19.88	
Dissolved Oxygen (mg/l): 8.8		Sediment Silt-Clay (%): 76.91		Total Carbon (%): 4.71	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 2.67		Condition: Marginal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	1.25	1	Pollution Indicative Species Abundance (%)	6.64	
Abundance (#/m2)	5476	1	Pollution Indicative Species Biomass (%)	0.33	5
Biomass (g/m2)	1.05	3	Pollution Sensitive Species Abundance (%)	3.32	
Carnivore-Omnivore Abundance (%)	5.39	1	Pollution Sensitive Species Biomass (%)	63.70	5
Deep Deposit Feeder Abundance (%)	90.46				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Amphiporus bioculatus		23		0.00114	
Carinoma tremaphoros		91		0.07498	
Cyathura polita		114		0.22720	
Eteone heteropoda		23		0.00114	
Glycinde solitaria		23		0.05680	
Heteromastus filiformis		250		0.15222	
Macoma mitchelli		114		0.10906	
Marenzelleria viridis		45		0.38170	
Neanthes succinea		23		0.00114	
Oligochaeta				0.00114	
Streblospio benedicti		68		0.00227	
Tubificidae imm. w/o cap. chaetae		273			
Tubificoides spp.		4430		0.03635	
Total w/ Epi.		5476		1.04512	
Total w/o Epi.		5476		1.04512	
Number of Taxa w/ Epi.		12			
Number of Taxa w/o Epi.		12			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
 AMBIENT TOXICITY STATIONS

Watershed: Big Annemessex River		Station: BA-05		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 27SEP01	
		Sampled Area: 0.044 sq.m		Time: 10:22:00	
BOTTOM ENVIRONMENT					
Depth (m): 1.2		Salinity (ppt): 15.78		Temperature (C): 20.64	
Dissolved Oxygen (mg/l): 8.6		Sediment Silt-Clay (%): 79.77		Total Carbon (%): 2.89	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.67		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.73	3	Pollution Indicative Species Abundance (%)	3.81	
Abundance (#/m2)	2386	5	Pollution Indicative Species Biomass (%)	2.60	5
Biomass (g/m2)	0.83	3	Pollution Sensitive Species Abundance (%)	59.05	
Carnivore-Omnivore Abundance (%)	32.38	5	Pollution Sensitive Species Biomass (%)	8.21	1
Deep Deposit Feeder Abundance (%)	35.24				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA	Abundance (#/m2)		Biomass (g/m2)		
Acteocina canaliculata	477		0.02272		
Carinoma tremaphoros	45		0.02726		
Crangon septemspinosa (Epi)	23		0.06134		
Glycinde solitaria	114		0.01590		
Haminoea solitaria	23		0.00227		
Heteromastus filiformis	23		0.03408		
Leucon americanus	409		0.01363		
Macoma mitchelli	273		0.50438		
Mediomastus ambiseta	818		0.02954		
Mulinia lateralis	23		0.02045		
Neanthes succinea	45		0.13859		
Paraesione luteola	23		0.00227		
Podarkeopsis levifuscina	45		0.01818		
Streblospio benedicti	68		0.00114		
Stylochus ellipticus (Epi)	23		0.00114		
Total w/ Epi.	2431		0.89290		
Total w/o Epi.	2386		0.83042		
Number of Taxa w/ Epi.	15				
Number of Taxa w/o Epi.	13				

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: BA-07			Rep: 01	
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Watershed: Big Annemessex River		Habitat: High Mesohaline Mud		Date: 27SEP01	
Gear: Young Grab		Sampled Area: 0.044 sq.m		Time: 10:57:45	
=====					
BOTTOM ENVIRONMENT					
=====					
Depth (m): 1.8		Salinity (ppt): 16.06		Temperature (C): 20.76	
Dissolved Oxygen (mg/l): 8.7		Sediment Silt-Clay (%): 67.53		Total Carbon (%): 2.88	
=====					
BENTHIC INDEX OF BIOTIC INTEGRITY					
=====					
B-IBI Score: 3.00		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.34	3	Pollution Indicative Species Abundance (%)	3.03	
Abundance (#/m2)	1500	3	Pollution Indicative Species Biomass (%)	5.05	3
Biomass (g/m2)	1.12	3	Pollution Sensitive Species Abundance (%)	80.30	
Carnivore-Omnivore Abundance (%)	46.97	5	Pollution Sensitive Species Biomass (%)	4.85	1
Deep Deposit Feeder Abundance (%)	42.42				
=====					
BENTHIC ABUNDANCE (per sq. meter)					
=====					
TAXA		Abundance (#/m2)		Biomass (g/m2)	

Acteocina canaliculata	545		0.02499		
Cyathura polita	23		0.00682		
Glycinde solitaria	68		0.00682		
Haminoea solitaria	23		0.01363		
Heteromastus filiformis	23		0.00227		
Leitoscoloplos spp.	45		0.07270		
Macoma mitchelli	114		0.17722		
Mediomastus ambiseta	568		0.01590		
Neanthes succinea	23		0.74522		
Paraprionospio pinnata	23		0.05453		
Podarkeopsis levifuscina	23		0.00227		
Streblospio benedicti	23		0.00227		

Total w/ Epi.	1500		1.12464		
Total w/o Epi.	1500		1.12464		
Number of Taxa w/ Epi.	12				
Number of Taxa w/o Epi.	12				
=====					

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Big Annesmessex River		Station: BA-09		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 9:09:15	
BOTTOM ENVIRONMENT					
Depth (m): 1.2		Salinity (ppt): 16.08		Temperature (C): 20.65	
Dissolved Oxygen (mg/l): 9.1		Sediment Silt-Clay (%): 50.31		Total Carbon (%): 2.06	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.67		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.81	3	Pollution Indicative Species Abundance (%)	0.00	
Abundance (#/m2)	1113	3	Pollution Indicative Species Biomass (%)	0.00	5
Biomass (g/m2)	0.90	3	Pollution Sensitive Species Abundance (%)	65.31	
Carnivore-Omnivore Abundance (%)	42.86	5	Pollution Sensitive Species Biomass (%)	50.32	3
Deep Deposit Feeder Abundance (%)	48.98				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Acteocina canaliculata		91		0.00454	
Carinoma tremaphoros		68		0.04544	
Cyathura polita		68		0.09770	
Glycinde solitaria		45		0.01818	
Heteromastus filiformis		45		0.10906	
Leucon americanus		23		0.00114	
Macoma mitchelli		45		0.08406	
Marenzelleria viridis		23		0.32035	
Mediomastus ambiseta		500		0.01136	
Neanthes succinea		45		0.18176	
Parahesion luteola		114		0.01363	
Podarkeopsis levifuscina		45		0.01136	
Total w/ Epi.		1113		0.89858	
Total w/o Epi.		1113		0.89858	
Number of Taxa w/ Epi.		12			
Number of Taxa w/o Epi.		12			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Big Annemessex River		Station: BA-10		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 27SEP01	
		Sampled Area: 0.044 sq.m		Time: 12:01:16	
BOTTOM ENVIRONMENT					
Depth (m): 2.4		Salinity (ppt): 16.47		Temperature (C): 20.85	
Dissolved Oxygen (mg/l): 9.0		Sediment Silt-Clay (%): 63.14		Total Carbon (%): 2.89	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.67		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.71	3	Pollution Indicative Species Abundance (%)	5.10	
Abundance (#/m2)	2227	5	Pollution Indicative Species Biomass (%)	5.01	3
Biomass (g/m2)	0.59	3	Pollution Sensitive Species Abundance (%)	67.35	
Carnivore-Omnivore Abundance (%)	57.14	5	Pollution Sensitive Species Biomass (%)	45.86	3
Deep Deposit Feeder Abundance (%)	19.39				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Acteocina canaliculata		1022		0.05680	
Ampelisca abdita		23		0.00227	
Amphiporus bioculatus		91		0.00114	
Clymenella torquata		23		0.20221	
Edotea triloba (Epi)		23		0.00114	
Glycinde solitaria		45		0.00114	
Leucon americanus		136		0.00114	
Listriella clymenellae		23		0.00114	
Macoma mitchelli		159		0.01818	
Mediomastus ambiseta		386		0.00909	
Neanthes succinea		91		0.02954	
Paraprionospio pinnata		23		0.02726	
Pectinaria gouldii		23		0.00454	
Podarkeopsis levifuscina		23		0.00114	
Saccoglossus kowalevskii		68		0.23174	
Streblospio benedicti		91		0.00227	
Total w/ Epi.		2249		0.59072	
Total w/o Epi.		2227		0.58958	
Number of Taxa w/ Epi.		16			
Number of Taxa w/o Epi.		15			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Manokin River		Station: MA-02		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 27SEP01	
		Sampled Area: 0.044 sq.m		Time: 15:36:58	
=====					
BOTTOM ENVIRONMENT					
=====					
Depth (m): 2.1		Salinity (ppt): 14.94		Temperature (C): 21.39	
Dissolved Oxygen (mg/l): 9.9		Sediment Silt-Clay (%): 67.70		Total Carbon (%): 2.19	
=====					
BENTHIC INDEX OF BIOTIC INTEGRITY					
=====					
B-IBI Score: 3.33		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	3.29	5	Pollution Indicative Species Abundance (%)	6.56	
Abundance (#/m2)	1386	3	Pollution Indicative Species Biomass (%)	19.42	3
Biomass (g/m2)	1.02	3	Pollution Sensitive Species Abundance (%)	44.26	
Carnivore-Omnivore Abundance (%)	52.46	5	Pollution Sensitive Species Biomass (%)	17.75	1
Deep Deposit Feeder Abundance (%)	29.51				
=====					
BENTHIC ABUNDANCE (per sq. meter)					
=====					
TAXA		Abundance (#/m2)		Biomass (g/m2)	

Acteocina canaliculata		409		0.02272	
Cyathura polita		23		0.13178	
Glycinde solitaria		68		0.02499	
Heteromastus filiformis		159		0.04317	
Leitoscoloplos spp.		45		0.13859	
Leucon americanus		23		0.00114	
Macoma mitchelli		182		0.11133	
Mediomastus ambiseta		114		0.00114	
Mulinia lateralis		45		0.19766	
Neanthes succinea		91		0.34080	
Oligochaeta				0.00114	
Paraesione luteola		45		0.00114	
Podarkeopsis levifuscina		91		0.00114	
Tubificidae imm. w/o cap. chaetae		45			
Tubificoides spp.		45		0.00114	

Total w/ Epi.		1386		1.01786	
Total w/o Epi.		1386		1.01786	
Number of Taxa w/ Epi.		14			
Number of Taxa w/o Epi.		14			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: MA-04			Rep: 01		
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Watershed: Manokin River		Habitat: High Mesohaline Mud		Date: 27SEP01	
Gear: Young Grab		Sampled Area: 0.044 sq.m		Time: 15:03:17	
=====					
BOTTOM ENVIRONMENT					
=====					
Depth (m): 1.2		Salinity (ppt): 13.84		Temperature (C): 21.54	
Dissolved Oxygen (mg/l): 9.7		Sediment Silt-Clay (%): 65.55		Total Carbon (%): 2.58	
=====					
BENTHIC INDEX OF BIOTIC INTEGRITY					
=====					
B-IBI Score: 4.00		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	3.27	5	Pollution Indicative Species Abundance (%)	9.52	
Abundance (#/m2)	1431	3	Pollution Indicative Species Biomass (%)	3.22	5
Biomass (g/m2)	0.71	3	Pollution Sensitive Species Abundance (%)	47.62	
Carnivore-Omnivore Abundance (%)	33.33	5	Pollution Sensitive Species Biomass (%)	51.53	3
Deep Deposit Feeder Abundance (%)	42.86				
=====					
BENTHIC ABUNDANCE (per sq. meter)					
=====					
TAXA		Abundance (#/m2)		Biomass (g/m2)	

Acteocina canaliculata	182		0.02499		
Cyathura polita	91		0.28854		
Glycinde solitaria	204		0.02954		
Heteromastus filiformis	91		0.04771		
Leitoscoloplos spp.	23		0.19766		
Leucon americanus	159		0.02045		
Macoma mitchelli	136		0.03862		
Mediomastus ambiseta	204		0.02045		
Oligochaeta			0.00114		
Streblospio benedicti	45		0.02272		
Tubificidae imm. w/o cap. chaetae	91				
Tubificoides spp.	204		0.01363		

Total w/ Epi.	1431		0.70546		
Total w/o Epi.	1431		0.70546		
Number of Taxa w/ Epi.	11				
Number of Taxa w/o Epi.	11				
=====					

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: MA-05		Rep: 01			
Watershed: Manokin River		Date: 27SEP01			
Gear: Young Grab		Time: 14:13:03			
Habitat: High Mesohaline Sand					
Sampled Area: 0.044 sq.m					
BOTTOM ENVIRONMENT					
Depth (m): 1.2		Salinity (ppt): 14.20			
Dissolved Oxygen (mg/l): 9.3		Sediment Silt-Clay (%): 30.01			
		Temperature (C): 21.34			
		Total Carbon (%): 1.08			
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.33		Condition: Meets Goal			
		# Attributes Scored: 6			
	Value	Score	Value	Score	
Shannon-Wiener Index	2.72	3	Pollution Indicative Species Abundance (%)	4.50	5
Abundance (#/m2)	6566	1	Pollution Indicative Species Biomass (%)	3.71	
Biomass (g/m2)	1.35	3	Pollution Sensitive Species Abundance (%)	56.40	5
Carnivore-Omnivore Abundance (%)	32.18	3	Pollution Sensitive Species Biomass (%)	8.09	
Deep Deposit Feeder Abundance (%)	58.82				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Acteocina canaliculata		1590		0.04998	
Amphiporus bioculatus		23		0.00114	
Carinoma tremaphoros		23		0.02045	
Glycinde solitaria		204		0.01818	
Heteromastus filiformis		295		0.07270	
Leucon americanus		159		0.00227	
Macoma mitchelli		250		0.07043	
Mediomastus ambiseta		1908		0.04090	
Micrura leidyi		23		0.37034	
Mulinia lateralis		68		0.04544	
Neanthes succinea		204		0.61798	
Oligochaeta				0.00114	
Podarkeopsis levifuscina		45		0.01363	
Streblospio benedicti		114		0.00454	
Stylochus ellipticus (Epi)		23		0.00227	
Tubificidae imm. w/o cap. chaetae		114			
Tubificoides spp.		1545		0.01818	
Total w/ Epi.		6589		1.34957	
Total w/o Epi.		6566		1.34730	
Number of Taxa w/ Epi.		16			
Number of Taxa w/o Epi.		15			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001

AMBIENT TOXICITY STATIONS

Watershed: Manokin River		Station: MA-07		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 28SEP01	
		Sampled Area: 0.044 sq.m		Time: 10:52:14	
BOTTOM ENVIRONMENT					
Depth (m): 2.1		Salinity (ppt): 13.41		Temperature (C): 20.22	
Dissolved Oxygen (mg/l): 9.4		Sediment Silt-Clay (%): 72.54		Total Carbon (%): 4.45	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.00		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	1.73	1	Pollution Indicative Species Abundance (%)	17.96	
Abundance (#/m2)	3794	3	Pollution Indicative Species Biomass (%)	0.11	5
Biomass (g/m2)	1.05	3	Pollution Sensitive Species Abundance (%)	7.19	
Carnivore-Omnivore Abundance (%)	8.98	1	Pollution Sensitive Species Biomass (%)	87.17	5
Deep Deposit Feeder Abundance (%)	85.03				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Carinoma tremaphoros		91		0.02272	
Cyathura polita		159		0.39306	
Glycinde solitaria		45		0.08406	
Heteromastus filiformis		68		0.03862	
Leucon americanus		45		0.00114	
Macoma balthica		68		0.43395	
Macoma mitchelli		23		0.02726	
Neanthes succinea		45		0.00682	
Oligochaeta				0.01818	
Streblospio benedicti		91		0.00114	
Tubificidae imm. w/o cap. chaetae		591			
Tubificoides spp.		2567		0.01818	
Total w/ Epi.		3794		1.04512	
Total w/o Epi.		3794		1.04512	
Number of Taxa w/ Epi.		11			
Number of Taxa w/o Epi.		11			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Manokin River		Station: MA-10		Rep: 01	
Gear: Young Grab		Habitat: Low Mesohaline		Date: 28SEP01	
		Sampled Area: 0.044 sq.m		Time: 12:03:17	
BOTTOM ENVIRONMENT					
Depth (m): 2.0		Salinity (ppt): 10.88		Temperature (C): 20.75	
Dissolved Oxygen (mg/l): 9.1		Sediment Silt-Clay (%): 30.92		Total Carbon (%): 2.74	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.80		Condition: Meets Goal		# Attributes Scored: 5	
	Value	Score		Value	Score
Shannon-Wiener Index	2.33	3	Pollution Indicative Species Abundance (%)	7.69	5
Abundance (#/m2)	2363	5	Pollution Indicative Species Biomass (%)	1.77	
Biomass (g/m2)	1.15	3	Pollution Sensitive Species Abundance (%)	15.38	
Carnivore-Omnivore Abundance (%)	14.42		Pollution Sensitive Species Biomass (%)	63.45	3
Deep Deposit Feeder Abundance (%)	62.50				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Carinoma tremaphoros		45		0.08861	
Cyathura polita		295		0.56800	
Edotea triloba (Epi)		45		0.00682	
Gammarus spp. (Epi)		23		0.00909	
Heteromastus filiformis		68		0.11360	
Leptocheirus plumulosus		91		0.01818	
Leucon americanus		136		0.01136	
Macoma mitchelli		204		0.13178	
Marenzelleria viridis		68		0.16358	
Oligochaeta				0.00114	
Streblospio benedicti		45		0.02045	
Tubificidae imm. w/o cap. chaetae		136			
Tubificoides spp.		1272		0.03635	
Total w/ Epi.		2431		1.16894	
Total w/o Epi.		2363		1.15304	
Number of Taxa w/ Epi.		12			
Number of Taxa w/o Epi.		10			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Wicomico River		Station: WI-01		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 13:58:55	
BOTTOM ENVIRONMENT					
Depth (m): 2.6		Salinity (ppt): 12.15		Temperature (C): 22.09	
Dissolved Oxygen (mg/l): 8.9		Sediment Silt-Clay (%): 85.68		Total Carbon (%): 2.71	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 2.67		Condition: Marginal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.44	3	Pollution Indicative Species Abundance (%)	29.17	
Abundance (#/m2)	1091	3	Pollution Indicative Species Biomass (%)	10.02	3
Biomass (g/m2)	0.52	3	Pollution Sensitive Species Abundance (%)	14.58	
Carnivore-Omnivore Abundance (%)	16.67	3	Pollution Sensitive Species Biomass (%)	12.64	1
Deep Deposit Feeder Abundance (%)	58.33				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA	Abundance (#/m2)		Biomass (g/m2)		
Carinoma tremaphoros	23		0.01818		
Glycinde solitaria	136		0.01818		
Macoma balthica	23		0.04771		
Macoma mitchelli	91		0.06362		
Mulinia lateralis	23		0.04771		
Neanthes succinea	23		0.31126		
Oligochaeta			0.00114		
Streblospio benedicti	136		0.00454		
Tubificidae imm. w/o cap. chaetae	159				
Tubificoides spp.	477		0.00909		
Total w/ Epi.	1091		0.52142		
Total w/o Epi.	1091		0.52142		
Number of Taxa w/ Epi.	9				
Number of Taxa w/o Epi.	9				

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: WI-02		Rep: 01	
Habitat: Low Mesohaline		Date: 26SEP01	
Sampled Area: 0.044 sq.m		Time: 14:26:00	
BOTTOM ENVIRONMENT			
Depth (m): 2.6		Salinity (ppt): 11.79	
Dissolved Oxygen (mg/l): 9.0		Sediment Silt-Clay (%): 65.81	
		Temperature (C): 22.20	
		Total Carbon (%): 2.46	
BENTHIC INDEX OF BIOTIC INTEGRITY			
B-IBI Score: 3.40		Condition: Meets Goal	
		# Attributes Scored: 5	
Shannon-Wiener Index		Value	Score
Abundance (#/m2)		3.17	5
Biomass (g/m2)		1227	3
Carnivore-Omnivore Abundance (%)		1.16	3
Deep Deposit Feeder Abundance (%)		40.74	1
		Pollution Indicative Species Abundance (%)	
		Pollution Indicative Species Biomass (%)	
		Pollution Sensitive Species Abundance (%)	
		Pollution Sensitive Species Biomass (%)	
BENTHIC ABUNDANCE (per sq. meter)			
TAXA		Abundance (#/m2)	
		Biomass (g/m2)	
Carinoma tremaphoros		45	
Cyathura polita		23	
Diadumene leucolena (Epi)		68	
Glycinde solitaria		182	
Heteromastus filiformis		114	
Leucon americanus		45	
Macoma balthica		68	
Macoma mitchelli		159	
Marenzelleria viridis		45	
Neanthes succinea		250	
Rhithropanopeus harrisii (Epi)		23	
Streblospio benedicti		114	
Tubificoides spp.		182	
Total w/ Epi.		1318	
Total w/o Epi.		1227	
Number of Taxa w/ Epi.		13	
Number of Taxa w/o Epi.		11	

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: WI-04		Rep: 01			
Watershed: Wicomico River		Date: 26SEP01			
Gear: Young Grab		Time: 14:46:11			
BOTTOM ENVIRONMENT					
Depth (m): 1.5		Salinity (ppt): 9.24			
Dissolved Oxygen (mg/l): 7.4		Sediment Silt-Clay (%): 47.73			
		Temperature (C): 22.71			
		Total Carbon (%): 1.7			
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.00		Condition: Meets Goal			
		# Attributes Scored: 5			
	Value	Score	Value	Score	
Shannon-Wiener Index	3.10	5	Pollution Indicative Species Abundance (%)	21.43	1
Abundance (#/m2)	954	3	Pollution Indicative Species Biomass (%)	0.85	
Biomass (g/m2)	0.81	1	Pollution Sensitive Species Abundance (%)	26.19	
Carnivore-Omnivore Abundance (%)	38.10		Pollution Sensitive Species Biomass (%)	85.19	5
Deep Deposit Feeder Abundance (%)	38.10				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Balanus improvisus (Epi)		23		0.00114	
Carinoma tremaphoros		136		0.02954	
Cyathura polita		182		0.34080	
Heteromastus filiformis		68		0.01136	
Macoma balthica		23		0.06134	
Macoma mitchelli		91		0.02726	
Marenzelleria viridis		45		0.28400	
Neanthes succinea		45		0.03181	
Oligochaeta				0.00114	
Streblospio benedicti		68		0.00682	
Tubificidae imm. w/o cap. chaetae		136			
Tubificoides spp.		159		0.01136	
Total w/ Epi.		977		0.80656	
Total w/o Epi.		954		0.80542	
Number of Taxa w/ Epi.		11			
Number of Taxa w/o Epi.		10			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Wicomico River		Station: WI-06		Rep: 01	
Gear: Young Grab		Habitat: Low Mesohaline		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 15:04:27	
=====					
BOTTOM ENVIRONMENT					
=====					
Depth (m): 1.5		Salinity (ppt): 8.09		Temperature (C): 23.07	
Dissolved Oxygen (mg/l): 7.2		Sediment Silt-Clay (%): 44.63		Total Carbon (%): 2.38	
=====					
BENTHIC INDEX OF BIOTIC INTEGRITY					
=====					
B-IBI Score: 4.60		Condition: Meets Goal		# Attributes Scored: 5	
	Value	Score		Value	Score
Shannon-Wiener Index	3.17	5	Pollution Indicative Species Abundance (%)	8.57	5
Abundance (#/m2)	2386	5	Pollution Indicative Species Biomass (%)	0.07	
Biomass (g/m2)	1.60	3	Pollution Sensitive Species Abundance (%)	32.38	
Carnivore-Omnivore Abundance (%)	28.57		Pollution Sensitive Species Biomass (%)	80.82	5
Deep Deposit Feeder Abundance (%)	3.81				
=====					
BENTHIC ABUNDANCE (per sq. meter)					
=====					
TAXA		Abundance (#/m2)		Biomass (g/m2)	

Amphiporus bioculatus		23		0.00114	
Apocorophium lacustre	(Epi)	23		0.00114	
Carinoma tremaphoros		182		0.02954	
Cyathura polita		409		0.77021	
Edotea triloba	(Epi)	23		0.00114	
Heteromastus filiformis		45		0.02726	
Laeonereis culveri		23		0.02045	
Leptocheirus plumulosus		523		0.07725	
Leucon americanus		204		0.00114	
Macoma mitchelli		318		0.11814	
Marenzelleria viridis		182		0.47485	
Neanthes succinea		45		0.02954	
Rangia cuneata		182		0.04771	
Rhithropanopeus harrisii	(Epi)	23		0.05453	
Streblospio benedicti		204		0.00114	
Tubificoides spp.		45		0.00114	

Total w/ Epi.		2454		1.65629	
Total w/o Epi.		2386		1.59949	
Number of Taxa w/ Epi.		16			
Number of Taxa w/o Epi.		13			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001

AMBIENT TOXICITY STATIONS

Watershed: Wicomico River		Station: WI-07		Rep: 01	
Gear: Young Grab		Habitat: Low Mesohaline		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 15:25:32	
BOTTOM ENVIRONMENT					
Depth (m): 3.0		Salinity (ppt): 6.86		Temperature (C): 22.99	
Dissolved Oxygen (mg/l): 6.0		Sediment Silt-Clay (%): 76.94		Total Carbon (%): 3.43	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 2.60		Condition: Degraded		# Attributes Scored: 5	
	Value	Score		Value	Score
Shannon-Wiener Index	3.02	5	Pollution Indicative Species Abundance (%)	23.73	1
Abundance (#/m2)	1340	3	Pollution Indicative Species Biomass (%)	0.16	
Biomass (g/m2)	0.70	1	Pollution Sensitive Species Abundance (%)	33.90	
Carnivore-Omnivore Abundance (%)	38.98		Pollution Sensitive Species Biomass (%)	72.82	3
Deep Deposit Feeder Abundance (%)	35.59				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Apocorophium lacustre (Epi)		23		0.00227	
Carinoma tremaphoros		159		0.07043	
Chiridotea almyra		23		0.00227	
Cyathura polita		273		0.23402	
Gammarus daiberi (Epi)		295			
Gammarus spp. (Epi)				0.11587	
Heteromastus filiformis		182		0.03408	
Leptocheirus plumulosus		91		0.02272	
Macoma balthica		23		0.02499	
Macoma mitchelli		45		0.00682	
Marenzelleria viridis		159		0.25219	
Melita nitida (Epi)		91		0.01363	
Neanthes succinea		68		0.05226	
Oligochaeta				0.00114	
Rhithropanopeus harrisii (Epi)		114		0.21584	
Streblospio benedicti		23		0.00114	
Tubificidae imm. w/o cap. chaetae		295			
Total w/ Epi.		1863		1.04966	
Total w/o Epi.		1340		0.70205	
Number of Taxa w/ Epi.		15			
Number of Taxa w/o Epi.		11			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: WY-112		Rep: 01			
Watershed: Wye River		Date: 26SEP01			
Gear: Young Grab		Time: 9:22:53			
Habitat: High Mesohaline Mud					
Sampled Area: 0.044 sq.m					
BOTTOM ENVIRONMENT					
Depth (m): 4.5		Salinity (ppt): 13.32			
Dissolved Oxygen (mg/l): 6.9		Sediment Silt-Clay (%): 59.00			
		Temperature (C): 23.01			
		Total Carbon (%): 2.45			
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 4.33		Condition: Meets Goal			
		# Attributes Scored: 6			
	Value	Score	Value	Score	
Shannon-Wiener Index	3.20	5	Pollution Indicative Species Abundance (%)	24.19	
Abundance (#/m2)	1409	3	Pollution Indicative Species Biomass (%)	12.47	3
Biomass (g/m2)	2.51	5	Pollution Sensitive Species Abundance (%)	29.03	
Carnivore-Omnivore Abundance (%)	29.03	5	Pollution Sensitive Species Biomass (%)	63.44	5
Deep Deposit Feeder Abundance (%)	16.13				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Carinoma tremaphoros		91		0.03862	
Glycinde solitaria		45		0.00227	
Heteromastus filiformis		114		0.02954	
Macoma balthica		364		1.59267	
Macoma mitchelli		114		0.03181	
Mulinia lateralis		114		0.29763	
Neanthes succinea		136		0.47939	
Oligochaeta				0.00114	
Parahesione luteola		136		0.02045	
Streblospio benedicti		182		0.01590	
Tubificidae imm. w/o cap. chaetae		45			
Tubificoides spp.		68		0.00454	
Total w/ Epi.		1409		2.51397	
Total w/o Epi.		1409		2.51397	
Number of Taxa w/ Epi.		11			
Number of Taxa w/o Epi.		11			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Wye River		Station: WY-125		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 9:53:58	
BOTTOM ENVIRONMENT					
Depth (m): 4.9		Salinity (ppt): 13.80		Temperature (C): 21.14	
Dissolved Oxygen (mg/l): 8.2		Sediment Silt-Clay (%): 64.76		Total Carbon (%): 1.47	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 3.67		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	3.29	5	Pollution Indicative Species Abundance (%)	17.02	
Abundance (#/m2)	1068	3	Pollution Indicative Species Biomass (%)	9.48	3
Biomass (g/m2)	0.90	3	Pollution Sensitive Species Abundance (%)	29.79	
Carnivore-Omnivore Abundance (%)	38.30	5	Pollution Sensitive Species Biomass (%)	39.32	3
Deep Deposit Feeder Abundance (%)	31.91				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA		Abundance (#/m2)		Biomass (g/m2)	
Acteocina canaliculata		23		0.00114	
Amphiporus bioculatus		45		0.03862	
Cyathura polita		45		0.01818	
Glycinde solitaria		136		0.02726	
Heteromastus filiformis		204		0.15222	
Macoma balthica		114		0.30672	
Macoma mitchelli		23		0.01363	
Mulinia lateralis		45		0.08406	
Neanthes succinea		45		0.24992	
Paraesione luteola		114		0.00454	
Streblospio benedicti		136		0.00114	
Tubificoides spp.		136		0.00114	
Total w/ Epi.		1068		0.89858	
Total w/o Epi.		1068		0.89858	
Number of Taxa w/ Epi.		12			
Number of Taxa w/o Epi.		12			

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: WY-127		Rep: 01	
Watershed: Wye River		Date: 26SEP01	
Gear: Young Grab		Time: 10:09:48	
Habitat: High Mesohaline Mud			
Sampled Area: 0.044 sq.m			
BOTTOM ENVIRONMENT			
Depth (m): 7.6		Salinity (ppt): 14.34	
Dissolved Oxygen (mg/l): 6.9		Sediment Silt-Clay (%): 63.51	
		Temperature (C): 22.77	
		Total Carbon (%): 2.25	
BENTHIC INDEX OF BIOTIC INTEGRITY			
B-IBI Score: 1.00		Condition: Severely Degraded	
		# Attributes Scored: 6	
		Value Score	
Shannon-Wiener Index		Value Score	
Abundance (#/m2)		Pollution Indicative Species Abundance (%)	
Biomass (g/m2)		Pollution Indicative Species Biomass (%)	
Carnivore-Omnivore Abundance (%)		Pollution Sensitive Species Abundance (%)	
Deep Deposit Feeder Abundance (%)		Pollution Sensitive Species Biomass (%)	
BENTHIC ABUNDANCE (per sq. meter)			
TAXA		Abundance (#/m2)	
		Biomass (g/m2)	
Carinoma tremaphoros		23	
Macoma balthica		23	
Macoma mitchelli		91	
Mulinia lateralis		23	
Parahesion luteola		45	
Streblospio benedicti		545	
Total w/ Epi.		750	
Total w/o Epi.		750	
Number of Taxa w/ Epi.		6	
Number of Taxa w/o Epi.		6	

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Station: WY-152		Rep: 01	
Watershed: Wye River		Date: 26SEP01	
Gear: Young Grab		Time: 10:35:13	
Habitat: High Mesohaline Mud			
Sampled Area: 0.044 sq.m			
BOTTOM ENVIRONMENT			
Depth (m): 3.1		Salinity (ppt): 12.62	
Dissolved Oxygen (mg/l): 6.3		Sediment Silt-Clay (%): 84.63	
		Temperature (C): 23.09	
		Total Carbon (%): 2.6	
BENTHIC INDEX OF BIOTIC INTEGRITY			
B-IBI Score: 4.00		Condition: Meets Goal	
		# Attributes Scored: 6	
	Value	Score	Value
Shannon-Wiener Index	2.72	3	7.23
Abundance (#/m2)	1886	5	1.59
Biomass (g/m2)	1.43	3	19.28
Carnivore-Omnivore Abundance (%)	42.17	5	55.19
Deep Deposit Feeder Abundance (%)	9.64		3
BENTHIC ABUNDANCE (per sq. meter)			
TAXA	Abundance (#/m2)		Biomass (g/m2)
Carinoma tremaphoros	227		0.10451
Coelotanypus spp.	68		0.01818
Cyathura polita	318		0.55437
Heteromastus filiformis	45		0.01590
Leptocheirus plumulosus	750		0.23856
Macoma balthica	45		0.23629
Macoma mitchelli	45		0.12723
Neanthes succinea	23		0.11133
Paraesione luteola	159		0.02045
Streblospio benedicti	68		0.00454
Tubificoides spp.	136		0.00114
Total w/ Epi.	1886		1.43250
Total w/o Epi.	1886		1.43250
Number of Taxa w/ Epi.	11		
Number of Taxa w/o Epi.	11		

BOTTOM ENVIRONMENT AND BENTHOS, SUMMER 2001
AMBIENT TOXICITY STATIONS

Watershed: Wye River		Station: WY-153		Rep: 01	
Gear: Young Grab		Habitat: High Mesohaline Mud		Date: 26SEP01	
		Sampled Area: 0.044 sq.m		Time: 10:48:37	
BOTTOM ENVIRONMENT					
Depth (m): 5.3		Salinity (ppt): 12.15		Temperature (C): 22.20	
Dissolved Oxygen (mg/l): 7.1		Sediment Silt-Clay (%): 83.79		Total Carbon (%): 2.7	
BENTHIC INDEX OF BIOTIC INTEGRITY					
B-IBI Score: 4.00		Condition: Meets Goal		# Attributes Scored: 6	
	Value	Score		Value	Score
Shannon-Wiener Index	2.30	3	Pollution Indicative Species Abundance (%)	7.43	
Abundance (#/m2)	3363	3	Pollution Indicative Species Biomass (%)	4.59	5
Biomass (g/m2)	2.77	5	Pollution Sensitive Species Abundance (%)	8.78	
Carnivore-Omnivore Abundance (%)	22.97	3	Pollution Sensitive Species Biomass (%)	73.38	5
Deep Deposit Feeder Abundance (%)	15.54				
BENTHIC ABUNDANCE (per sq. meter)					
TAXA	Abundance (#/m2)		Biomass (g/m2)		
Carinoma tremaphoros	91		0.06589		
Chironomidae			0.00114		
Chironomus spp.	23				
Cyathura polita	91		0.47258		
Leptocheirus plumulosus	1659		0.38397		
Macoma balthica	204		1.56314		
Macoma mitchelli	23		0.10224		
Mulinia lateralis	23		0.11814		
Oligochaeta			0.00114		
Paraesione luteola	568		0.04998		
Streblospio benedicti	159		0.00909		
Tubificidae imm. w/o cap. chaetae	45				
Tubificoides spp.	477		0.00682		
Total w/ Epi.	3363		2.77411		
Total w/o Epi.	3363		2.77411		
Number of Taxa w/ Epi.	11				
Number of Taxa w/o Epi.	11				