

**NEWTOWN CREEK COALITION**  
**Newtown Borough Newtown Twp.**  
**Bucks Co. Community College**  
**STEM Department**

**Newtown Creek**



**WATER QUALITY MONITORING PROGRAM**

**FIELD DATA**

**DATE of TESTING: June 9, 2018**

<b>PARAMETERS</b>	<b>SITE #1 Below Hidden Lake Dam</b>	<b>SITE #2 George School Campus</b>
Time.....	10-11:30 am.....	12:30-2 pm
Latitude...(decimal deg).....	40.24438	.....40.21213
Longitude.(decimal deg).....	-74.93323	.....-74.94113
Elevation (m).....	60.0	.....23.0
Average Width (m).....	3.45	.....4.28
Average Depth (m).....	0.07	.....0.20
Average Velocity (m/sec).....	0.841	.....1.093
Volume of Flow (m <sup>3</sup> /sec).....	0.203	.....0.863
Air Temperature (°C).....	24.2	.....26.7
Water Temperature (°C).....	15.7	.....20.0
Turbidity (JTU).....	20.0	.....0.0
Dissolved Oxygen (mg/l).....	8.2	.....9.9
Oxygen Saturation (%).....	87.0	.....103.0
Carbon Dioxide (mg/l).....	50.0	.....42.0
pH.....	7.5	.....7.7
Total Alkalinity (mg/l CaCO <sub>3</sub> ).....	120.0	.....160.0
Total Ca/Mg Hardness (mg/lCaCO <sub>3</sub> )..	180.0	.....220.0
Electrical Conductivity (µS/cm).....	500.0	.....750.0
Oxidation Reduction Potential (mV).	228.0	.....217.0
Nitrate (mg/l NO <sub>3</sub> ).....	12.40	.....5.76
Phosphate (mg/l PO <sub>4</sub> ).....	0.73	.....0.32

**Participants: Newtown Creek Coalition**  
**M. Bernarsky**  
**Prof. of Ecology**

**Bucks County Community College**  
**Lilianna Abdah (student)**  
**Yousef Karkabi (student)**



# Biotic Community of a Freshwater Stream

## MACROINVERTEBRATES

### Hilsenhoff Biotic Index Calculation



Date: 6-9-2018 Time: 10-12 am

Name of Stream: Newtown Creek, Newtown PA

Observer: M. Bernarsky + BCCC STEM Students

Location: Below Hidden Lake Dam (SITE #1)

LATITUDE: 40.24438

LONGITUDE: -74.93323

ELEVATION: 60 meters /197 ft

A-adult L-larva P-pupa N-nymph

TAXA		# of	Tolerance	
Common Name	Scientific Name	Individuals (n) x	Value (a)	= Product (n x a)
1. Aquatic Earthworm (A)	Oligochaeta		8	
2. Leech (A)	Hirudinea		10	
4. Pouch Snail (A)	Physidae		8	
3. Flatworm (A)	Turbellaria		4	
5. Orb Snail (A)	Planorbidae		6	
6. Gilled Snail (A)	Ampullariidae		4	
7. Fingernail Clam (A)	Veneroida		8	
8. Freshwater Mussel (A)	Unionoida		8	
9. Crayfish/Freshwater Shrimp (A)	Decapoda		6	
10. Aquatic Sowbug (A)	Isopoda		8	
11. Scud (Gammarid) (A)	Amphipoda		4	
12. Dragonfly (N)	Anisoptera		3	
13. Damselfly (N)	Zygoptera		7	
14. Water Penny Beetle (L)	Psephenidae		4	
15. Riffle Beetle (A/N)	Elmidae		4	
16. Crawling Water Beetle (A/L)	Halipidae		7	
17. Water Scavenger Beetle (A/L)	Hydrophilidae		5	
18. Predaceous Diving Beetle (A/L)	Dytiscidae		5	
19. Whirligig Beetle (A/L)	Gyrinidae		4	
20. Long-toed Beetle (A/L)	Dryopidae		5	
21. Other Beetles (A/L)	Coleoptera fam.	3	5	15
22. Dobsonfly/Fishfly (L)	Corydalidae		0	
23. Alderfly (L)	Sialidae		4	
24. Spongilla Fly (L)	Sysyridae		5	
25. Watersnipe Fly (L)	Anthericidae		2	
26. Blackfly (L)	Simuliidae	5	6	30
27. Crane fly (L)	Tipulidae		3	
28. Horsefly (L)	Tabanidae		6	
29. Soldierfly (L)	Stratiomyidae		7	
30. Midgefly (red/non-red) (L)	Chironomonidae		7	
31. Hoverfly (rat-tailed maggot) (L)	Syrphidae		10	
32. Long-legged Fly (L)	Dolichopodidae		4	
33. Net-winged Midge (L)	Blephariceridae		0	
34. Mosquito (L/P)	Cilicidae		9	
35. Backswimmer (A/N)	Notonectidae		6	
36. Water Boatman (A/N)	Coraxidae		5	
37. Water Scorpion (A/N)	Nepidae		8	
38. Water Strider (A/N)	Gerridae		6	
39. Caddisfly (L)	Trichoptera		2	
40. Stonefly (N)	Plecoptera		1	
41. Mayfly (N)	Ephemeroptera		3	

$$N = 8 \quad \sum n_i a_i = 45$$

$$\sum n_i a_i / N = 45 / 8 \\ = 5.625 \text{ HBI}$$



# Biotic Community of a Freshwater Stream

## MACROINVERTEBRATES

### Hilsenhoff Biotic Index Calculation



Date: 6-9-2018 Time: 12-2 pm

Name of Stream: Newtown Creek, Newtown PA

Observer: M. Bernarsky + BCCC STEM Students

Location: George School (SITE #2)

LATITUDE: 40.24438

LONGITUDE: -74.93323

ELEVATION: 60 meters /197 ft

A-adult L-larva P-pupa N-nymph

TAXA		# of	Tolerance	
Common Name	Scientific Name	Individuals (n) x	Value (a)	= Product (n x a)
1. Aquatic Earthworm (A)	Oligochaeta		8	
2. Leech (A)	Hirudinea		10	
4. Pouch Snail (A)	Physidae		8	
3. Flatworm (A)	Turbellaria		4	
5. Orb Snail (A)	Planorbidae		6	
6. Gilled Snail (A)	Ampullariidae		4	
7. Fingernail Clam (A)	Veneroida		8	
8. Freshwater Mussel (A)	Unionoida		8	
9. Crayfish/Freshwater Shrimp (A)	Decapoda		6	
10. Aquatic Sowbug (A)	Isopoda		8	
11. Scud (Gammarid) (A)	Amphipoda		4	
12. Dragonfly (N)	Anisoptera		3	
13. Damselfly (N)	Zygoptera		7	
14. Water Penny Beetle (L)	Psephenidae		4	
15. Riffle Beetle (A/N)	Elmidae		4	
16. Crawling Water Beetle (A/L)	Halipidae		7	
17. Water Scavenger Beetle (A/L)	Hydrophilidae		5	
18. Predaceous Diving Beetle (A/L)	Dytiscidae		5	
19. Whirligig Beetle (A/L)	Gyrinidae		4	
20. Long-toed Beetle (A/L)	Dryopidae		5	
21. Other Beetles (A/L)	Coleoptera fam.	8	5	40
22. Dobsonfly/Fishfly (L)	Corydalidae		0	
23. Alderfly (L)	Sialidae		4	
24. Spongilla Fly (L)	Sysiridae		5	
25. Watersnipe Fly (L)	Anthericidae		2	
26. Blackfly (L)	Simuliidae	12	6	72
27. Crane fly (L)	Tipulidae		3	
28. Horsefly (L)	Tabanidae		6	
29. Soldierfly (L)	Stratiomyidae		7	
30. Midgefly (red/non-red) (L)	Chironomonidae		7	
31. Hoverfly (rat-tailed maggot) (L)	Syrphidae		10	
32. Long-legged Fly (L)	Dolichopodidae		4	
33. Net-winged Midge (L)	Blephariceridae		0	
34. Mosquito (L/P)	Cilicidae		9	
35. Backswimmer (A/N)	Notonectidae		6	
36. Water Boatman (A/N)	Coraxidae		5	
37. Water Scorpion (A/N)	Nepidae		8	
38. Water Strider (A/N)	Gerridae		6	
39. Caddisfly (L)	Trichoptera **[12+ empty stone cases]		2	
40. Stonefly (N)	Plecoptera		1	
41. Mayfly (N)	Ephemeroptera		3	

$$N = 20 \quad \sum n_i a_i = 112$$

$$\sum n_i a_i / N = 112 / 20 \\ = 5.600 \text{ HBI}$$



**NEWTOWN CREEK COALITION**  
**Newtown Borough Newtown Twp.**  
**Bucks Co. Community College**  
**STEM Dept. / CORE Club**

**Newtown Creek**



**WATER QUALITY MONITORING PROGRAM**

**FIELD DATA**

**DATE of TESTING: 5-14-2016**

<b>PARAMETERS</b>	<b>SITE #1  Below Hidden Lake Dam   Newtown Pa</b>	<b>SITE #2  George School Campus  Langhorne Pa</b>
<b>Time.....</b>	<b>10-11:30am</b>	<b>12:30-2:00pm</b>
<b>Latitude...(decimal deg).....</b>	<b>40.24438</b>	<b>40.21213</b>
<b>Longitude.(decimal deg).....</b>	<b>-74.93323</b>	<b>-74.94113</b>
<b>Elevation (m).....</b>	<b>60.0</b>	<b>23.0</b>
<b>Average Width (m).....</b>	<b>5.0</b>	<b>5.0</b>
<b>Average Depth (m).....</b>	<b>0.12</b>	<b>0.197</b>
<b>Average Velocity (m/sec).....</b>	<b>0.220</b>	<b>0.132</b>
<b>Volume of Flow (m<sup>3</sup>/sec).....</b>	<b>0.132</b>	<b>0.130</b>
<b>Air Temperature (°C).....</b>	<b>20.4</b>	<b>25.8</b>
<b>Water Temperature (°C).....</b>	<b>17.7</b>	<b>19.4</b>
<b>Turbidity (JTU).....</b>	<b>20.0</b>	<b>0.0</b>
<b>Dissolved Oxygen (mg/l).....</b>	<b>9.9</b>	<b>10.1</b>
<b>Oxygen Saturation (%).....</b>	<b>104.0</b>	<b>106.0</b>
<b>Carbon Dioxide (mg/l).....</b>	<b>18.0</b>	<b>14.0</b>
<b>pH.....</b>	<b>8.0</b>	<b>8.1</b>
<b>Total Alkalinity (mg/l CaCO<sub>3</sub>).....</b>	<b>100.0</b>	<b>80.0</b>
<b>Total Ca/Mg Hardness (mg/lCaCO<sub>3</sub>)..</b>	<b>200.0</b>	<b>200.0</b>
<b>Electrical Conductivity (µS/cm).....</b>	<b>490.0</b>	<b>600.0</b>
<b>Oxidation Reduction Potential (mV).</b>	<b>114.0</b>	<b>130.0</b>
<b>Nitrate (mg/l NO<sub>3</sub>).....</b>	<b>2.20</b>	<b>2.00</b>
<b>Phosphate (mg/l PO<sub>4</sub>).....</b>	<b>0.10</b>	<b>0.19</b>

**Participants:** Newtown Cr Coalition  
Mike Bernarsky  
Mike Sellers  
Annamarie Kaminski

BCCC Students  
Will Fernandez  
Matt Rosenwasser  
Tanvi Patel  
Katherine Ascencio  
Chris McEachron



# Biotic Community of a Freshwater Stream

## MACROINVERTEBRATES

### Hilsenhoff Biotic Index Calculation



Date: 5-14-2016 Time: 10-12am

Name of Stream: Newtown Creek - UPPER SITE

Observer: Newtown Creek Coalition Location: 300 yds below Hidden Lake Dam / Newtown, PA 18940

A-adult L-larva P-pupa N-nymph

TAXA		# of	Tolerance	
Common Name	Scientific Name	Individuals (n)	Value (a)	Product (n x a)
1. Aquatic Earthworm (A)	Oligochaeta		8	
2. Leech (A)	Hirudinea		10	
4. Pouch Snail (A)	Physidae	4	8	32
3. Flatworm (A)	Turbellaria	28	4	112
5. Orb Snail (A)	Planorbidae		6	
6. Gilled Snail (A)	Ampullariidae	3	4	12
7. Fingernail Clam (A)	Veneroida	7	8	56
8. Freshwater Mussel (A)	Unionoida		8	
9. Crayfish/Freshwater Shrimp (A)	Decapoda	2	6	12
10. Aquatic Sowbug (A)	Isopoda	3	8	24
11. Scud (Gammarid) (A)	Amphipoda	9	4	36
12. Dragonfly (N)	Anisoptera	1	3	3
13. Damselfly (N)	Zygoptera	3	7	21
14. Water Penny Beetle (L)	Psephenidae	2	4	8
15. Riffle Beetle (A/N)	Elmidae		4	
16. Crawling Water Beetle (A/L)	Halipidae		7	
17. Water Scavenger Beetle (A/L)	Hydrophilidae		5	
18. Predaceous Diving Beetle (A/L)	Dytiscidae	14	5	70
19. Whirligic Beetle (A/L)	Gyrinidae		4	
20. Long-toed Beetle (A/L)	Drvopidae		5	
21. Other Beetles (A/L)	Coleoptera fam.		5	
22. Dobsonfly/Fishfly (L)	Corydalidae		0	
23. Alderfly (L)	Sialidae		4	
24. Spongilla Fly (L)	Sysyridae		5	
25. Watersnipe Fly (L)	Anthericidae		2	
26. Blackfly (L)	Simuliidae	8	6	48
27. Cranefly (L)	Tipulidae		3	
28. Horsefly (L)	Tabanidae		6	
29. Soldierfly (L)	Stratiomyidae		7	
30. Midgefly (red/non-red) (L)	Chironomonidae		7	
31. Hoverfly (rat-tailed maggot) (L)	Syrphidae		10	
32. Long-legged Fly (L)	Dolichopodidae		4	
33. Net-winged Midge (L)	Blephariceridae		0	
34. Mosquito (L/P)	Cilicidae		9	
35. Backswimmer (A/N)	Notonectidae		6	
36. Water Boatman (A/N)	Coraxidae		5	
37. Water Scorpion (A/N)	Nepidae		8	
38. Water Strider (A/N)	Gerridae		6	
39. Caddisfly (L)	Trichoptera	14	2	28
40. Stonefly (N)	Plecoptera		1	
41. Mayfly (N)	Ephemeroptera	4	3	12

N = 102

$\sum n_i a_i = 474$

$\sum n_i a_i / N = 474 / 102 = 4.647$  HBI [GOOD Water Quality/some organic pollution possible]



# Biotic Community of a Freshwater Stream

## MACROINVERTEBRATES

### Hilsenhoff Biotic Index Calculation



Date: 5-14-2016 Time: 2:30-2:00pm

Name of Stream: Newtown Creek – LOWER SITE

Observer: Newtown Creek Coalition

Location: Back of George School / Langhorne PA 19047

TAXA		A-adult	L-larva	P-pupa	N-nymph			
Common Name	Scientific Name	# of Individuals (n)			Tolerance Value (a)	=	Product (n x a)	
1. Aquatic Earthworm (A)	Oligochaeta	1			8		8	
2. Leech (A)	Hirudinea	2			10		20	
4. Pouch Snail (A)	Physidae				8			
3. Flatworm (A)	Turbellaria				4			
5. Orb Snail (A)	Planorbidae				6			
6. Gilled Snail (A)	Ampullariidae				4			
7. Fingernail Clam (A)	Veneroida				8			
8. Freshwater Mussel (A)	Unionoida				8			
9. Crayfish/Freshwater Shrimp (A)	Decapoda	4			6		24	
10. Aquatic Sowbug (A)	Isopoda	3			8		24	
11. Scud (Gammarid) (A)	Amphipoda	20			4		80	
12. Dragonfly (N)	Anisoptera				3			
13. Damselfly (N)	Zygoptera				7			
14. Water Penny Beetle (L)	Psephenidae				4			
15. Riffle Beetle (A/N)	Elmidae	5			4		20	
16. Crawling Water Beetle (A/L)	Halipidae				7			
17. Water Scavenger Beetle (A/L)	Hydrophilidae				5			
18. Predaceous Diving Beetle (A/L)	Dytiscidae	4			5		20	
19. Whirligig Beetle (A/L)	Gyrinidae				4			
20. Long-toed Beetle (A/L)	Dryopidae				5			
21. Other Beetles (A/L)	Coleoptera fam.				5			
22. Dobsonfly/Fishfly (L)	Corydalidae				0			
23. Alderfly (L)	Sialidae				4			
24. Spongilla Fly (L)	Sysyridae				5			
25. Watersnipe Fly (L)	Anthericidae				2			
26. Blackfly (L)	Simuliidae	17			6		102	
27. Cranefly (L)	Tipulidae				3			
28. Horsefly (L)	Tabanidae				6			
29. Soldierfly (L)	Stratiomyidae				7			
30. Midgefly (red/non-red) (L)	Chironomonidae	3			7		21	
31. Hoverfly (rat-tailed maggot) (L)	Syrphidae				10			
32. Long-legged Fly (L)	Dolichopodidae				4			
33. Net-winged Midge (L)	Blephariceridae				0			
34. Mosquito (L/P)	Cilicidae				9			
35. Backswimmer (A/N)	Notonectidae				6			
36. Water Boatman (A/N)	Coraxidae				5			
37. Water Scorpion (A/N)	Nepidae				8			
38. Water Strider (A/N)	Gerridae	1			6		6	
39. Caddisfly (L)	Trichoptera	1			2		2	
40. Stonefly (N)	Plecoptera	13			1		13	
41. Mayfly (N)	Ephemeroptera	20			3		60	

N = 94

$\sum n_i a_i = 400$

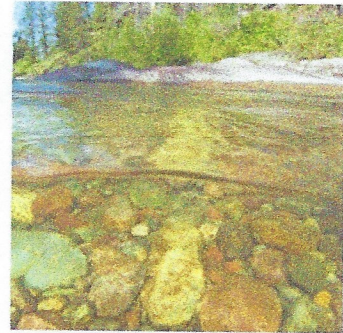
$\sum n_i a_i / N = 400/94 = 4.255$  HBI [VERY GOOD-GOOD possible/slight organic pollution]



# WATER QUALITY CRITERIA



EPA/Penna. DEP Standards  
Freshwater Lakes & Streams



## WATER QUALITY PARAMETER

## ACCEPTABLE/RECOMMENDED VALUES

<b>WATER TEMP (°C)</b> .....	Apr 8-14 <sup>o</sup>	Sep 24-28 <sup>o</sup>
(NOTE: Temps above the ranges are of more concern than those below the ranges.)	May 14-21 <sup>o</sup>	Oct 19-23 <sup>o</sup>
	Jun 21-23 <sup>o</sup>	Nov 10-18 <sup>o</sup>

FISH	SHORT-TERM MAX		OPTIMUM FOR SPAWNING	
Bluegill	35°C	95°F	25°C	77°F
Trout	24°C	75°F	9°C	48°F

**TURBIDITY** .....(JTU = Jackson Turbidity Units)..... 30.0 JTU or less

**DISSOLVED OXYGEN**..... 5.0 mg/l or greater during 24-hr period

mg/l	Effect on Aquatic Organisms
0.0-2.0	Too low to support most aquatic organisms.
2.0-4.0	Tolerated by only a few fish & aquatic insects.
4.0-7.0	OK for most aquatic organisms/too low for cold water fish.
7.0-11.0	Supports healthy populations of aquatic organisms.

**OXYGEN SATURATION**..... 80 – 120%

(NOTE: Values may vary from 50 – 140%)

**CARBONDIOXIDE**..... 10.0 mg/l or less

**PH**..... 6.0 – 8.5 (range for surface waters: 5.0-9.5)

**TOTAL ALKALINITY**..... 80 – 120 mg/l CaCO<sub>3</sub>

**TOTAL Ca/Mg HARDNESS**..... 60 – 180 mg/l CaCO<sub>3</sub>  
(greater than 500 mg/l toxic to aquatic life)

Soft Water	0-60
Moderately Hard water	61-120
Hard Water	121-180
Very hard Water	> 180

\*\*\*[NOTE: Carbon Dioxide, pH, Alkalinity, Hardness & Limestone Geology all interrelated]\*\*\*



<b><u>TOTAL DISSOLVED SOLIDS (TDS)</u></b> .....	<50 mg/l	Nutrient Poor
[NOTE: $E_c = TDS/0.64$ ]	50-100 mg/l	Low Nutrients (OLIGOTROPHIC)
	100-200 mg/l	Nutrient-rich (EUTROPHIC)
	>200 mg/l	Excess Nutrients(ADVANCED EUTROPHIC)

<b><u>ELECTRICAL CONDUCTIVITY (<math>E_c</math>)</u></b> .....	<78 microS/cm	Nutrient Poor
[NOTE: $TDS = 0.64 \times E_c$ ]	78-156 microS/cm	Low Nutrients (OLIGOTROPHIC)
	156-313 microS/cm	Nutrient-rich (EUTROPHIC)
	>313 microS/cm	Excess Nutrients (ADVANCED EUTROPHIC)

<b><u>NITRATE (<math>NO_3</math>)</u></b> .....	Natural Levels usually	< 1.0 mg/l
> 0.5 algal blooms ??	Acceptable levels	< 10.0 mg/l
10.0 MAX for drinking water	Recommended for sensitive freshwater organisms.	< 0.06 mg/l

**RANGE FOR NATURAL SURFACE WATERS**

Nitrate-Nitrogen ( $NO_3-N$ ) 0.10 - 4.0 mg/l

[4.4 multiplier]

Total Nitrate( $NO_3^{2-}$ ) 0.44 - 17.0 mg/l

<b><u>PHOSPHATE (<math>PO_4</math>) orthophosphate</u></b> .....	< 0.1 mg/l	(streams not entering into lakes)
(Major LIMITING FACTOR in Aquatic Systems)	< 0.05 mg/l	(streams entering into lakes)
	< 0.025 mg/l	(in lakes)

**RANGE FOR MOST NATURAL WATERS**

Orthophosphate ( $PO_4^{3-}$ ) 0.90 - 3.15 mg/l

[IDEAL RATIO of 16  $NO_3$  : 1  $PO_4$ ]

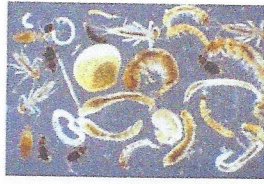
Uncontaminated Lakes/Streams	0.01-0.03 mg/l
Stimulates Aquatic Plant/Algae Growth	0.025-0.10 mg/l
MAX level before eutrophication	0.10 mg/l
Accelerated Aquatic Plant/Algal Growth (eutrophication/oxygen depletion)	>0.10 mg/l

**ORP (Oxidation Reduction Potential)**:..... +300 - 340 mV (Ideal for most active/efficient system)

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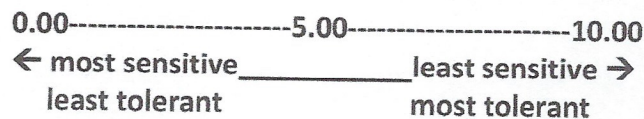


## Macroinvertebrate Survey



### Hilsenhoff Biotic Index a biological assessment water quality

The **Hilsenhoff Biotic Index (HBI)** estimates the overall tolerance of a macroinvertebrate community in a freshwater stream. The Index is weighted by the relative abundance of each organism **TAXA** (Order/Family/Genus/etc.), that are found in collected samples using kick seines, D-frame nets, etc. Each different type of invertebrate organism is assigned a **TOLERANCE VALUE** on a **0 – 10 scale**. The values are based on an organism's sensitivity to organic pollution.



The statistical equation for the index is:

$$HBI = \sum n_i a_i / N$$

$\sum$  = sum of

$n$  = number of individuals in taxa  $i$

$a$  = tolerance value of taxa  $i$

$N$  = total number of individuals for all taxa in the sample

#### Hilsenhoff Biotic Index Scale

Biotic Index Value	Water Quality	Degree of Organic Pollution
0.00 - 3.75	Excellent	Organic Pollution Unlikely
3.76 - 4.25	Very Good	Possible Slight Organic Pollution
4.26 - 5.00	Good	Some organic pollution probable
5.01 - 5.75	Fair	Fairly substantial pollution likely
5.76 - 6.50	Fairly Poor	Substantial pollution likely
6.51 - 7.25	Poor	Very substantial pollution likely
7.26 - 10.00	Very Poor	Severe organic pollution likely

#### EXAMPLE:

TAXA (i)	# of Individuals (n)	Tolerance Value (a)	Product (n x a)
Stone flies Plecoptera	7	1	7
Water Pennies Psephenidae	17	4	68
Blackfly Simuliidae	20	6	120
Watersnipe Fly Anthericidae	3	2	6
	$N = 47$		$\sum n_i a_i = 201$

$$\sum n_i a_i / N = 201/47 = 4.28 \text{ Water Quality - GOOD / Some organic pollution possible}$$



## Newtown Creek Coalition WATER QUALITY MONITORING PROGRAM

[Testing conducted on SATURDAY, June 9, 2018]

<u>Physical &amp; Chemical Test Results:</u>	Criteria	Upper Lower (SITE #1 / SITE #2)	
		JUN 2018	MAY 2016
*Flow (meters/sec).....		0.203 / 0.863	0.132 / 0.130
*Water Temperature.....	JUN 21-23°C .....	15.7 / 20.0	17.7 / 19.4.
*Turbidity.....	30 JTU or less. ....	20.0 / 0.0	20.0 / 0.0.
*Dissolved Oxygen.....	5.0 mg/L or less .....	8.2 / 9.9	9.9 / 10.1
*Oxygen Saturation.....	80-120 % .....	87.0 / 103.0	104.0 / 106.0
*Carbon Dioxide.....	10.0 mg/L or less.....	50.0 / 42.0	* 18.0 / 14.0
*pH.....	5.0 mg/L or greater/24 hrs....	7.5 / 7.7	8.0 / 8.1
*Total Alkalinity.....	80-120 mg/L CaCO <sub>3</sub> .....	120.0 / 160.0	* 100.0 / 80.0
*Ca/Mg Hardness.....	60-180 mg/L CaCO <sub>3</sub> .....	180.0 / 220.0	200.0 / 200.0
*Electrical Conductivity..	>313 microS/cm EC.....	500.0 / 750.0	* 490.0 / 600.0
*Oxidation Reduction Potential....	+300-340 mV.....	228 / 217	* 114 / 130
*Nitrate.....	< 10.0 mg/L.....	12.4 / 5.76	* 2.2 / 2.0
*Phosphate.....	< 0.1 mg/L.....	0.73 / 0.32	* 0.10 / 0.19

NOTE: The most significant change in Newtown Creek is the increase in **dissolved substances (EC)** and **nutrients (NO<sub>3</sub> / PO<sub>4</sub>)** from **MAY 2016** to **JUN 2018**, in spite of the greater volume of flow for JUN 2018, which should act as a dilution factor. Also, there is a significant increase in Electrical Conductivity (EC) between the Upper and Lower test sites. Except for a slight increase in phosphate In MAY 2016, NO<sub>3</sub>/PO<sub>4</sub> levels actually decreased between the Upper(SITE #1) & Lower(SITE #2) sites. Therefore, the higher levels of EC on JUN 9, 2018 might be related to the Tribona pesticide application on JUN 6, 2018. We are waiting to hear back from an inquiry with Penna. DEP about the pesticide.



2.

**Biological Survey of Macroinvertebrates:** Stream was essentially devoid of organisms. Only low numbers of blackfly larvae & some beetle larvae were found. The water was apparently treated with pesticide (reason not clear) just 4 days before our survey, & might be the reason for the lack of healthy macroinvertebrate populations at both the Upper and Lower Monitoring sites. Although lower biomass is typical after the May hatching of many stream macroinvertebrates, the difference in both biomass and species diversity between the MAY 2016 and JUN 2018 testing is significant.

M.S. Bernarsky, Prof. of Ecology, Bucks Co. Community College





## Success

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## Summary

Field	Value
Prefix	Mr.
First Name	Michael
Last Name	Bernarsky
Address	Bucks County Community College 275 Swamp Road PA Newtown United States
Email	michael.bernarsky@bucks.edu
Confirm Email	michael.bernarsky@bucks.edu
Phone Number	(267) 265-8555
Mobile Phone Number	(267) 265-8555
Comments	We conducted water quality tests on JUNE 9, 2018 at Newtown Creek, Bucks Co., Newtown PA. A sign was posted at one of our sites by Black Lagoon Pond Management....stating that water was treated on June 6 with a pesticide "TRIBANO" Could you let us know was it is used for...and the hazards it might pose. Thank you.