

**Table 1** – Aquatic macroinvertebrates, identified to the genus level that are acidophilous and references in which their response to acidity is documented. These organisms were used in this study to generate a Macroinvertebrate Acid Tolerance Index that is part of the Acid Biological Assessment Profile.

<b>Order</b>	<b>Genera</b>	<b>No. of Species</b>	<b>Reference</b>
Diptera	<i>Simulium</i> , <i>Conchapelopia</i> , <i>Cricotopus</i> , <i>Eukiefferiella</i> , <i>Heterotrissocladius</i> sp.	7	Simpson, 1983; Simpson et al., 1985
Ephemeroptera	<i>Epeorus</i> sp.	1	Bode et al., 1993
Plecoptera	<i>Amphinemura</i> , <i>Leuctra</i> , <i>Isoperla</i> sp.	3	Simpson et al., 1985; Sutcliffe and Hildrew, 1989; Fjellheim and Raddum, 1990
Trichoptera	<i>Rhyacophila</i>	5	Harris and Lawrence, 1978; Simpson et al., 1985; Fjellheim and Raddum, 1990

**Table 2** – Flow- (or volume-) corrected trends for precipitation chemistry (one site) and stream chemistry (three sites) in the Neversink River watershed.

<b>Site</b>	<b>Range</b> (water yr.)	<b>pH</b> (units/yr)	<b>ANC</b> ( $\mu\text{eq/L/yr}$ )	<b>Al<sub>IM</sub></b> ( $\mu\text{mol/L/yr}$ )	<b>Ca<sup>2+</sup></b> ( $\mu\text{eq/L/yr}$ )
Precipitation, NY-68	1987-2003	+0.01	---	---	ns
Stream, NE-05	1987-2003	+0.01	+0.26	ns	-1.2 5
Stream, NW-01	1991-2003	+0.006	ns	-0.53	-0.66
Stream, NW-06	1987-2003	+0.01	ns	+0.02	-2.23

ns – indicates trend was not significant at  $p \leq 0.05$

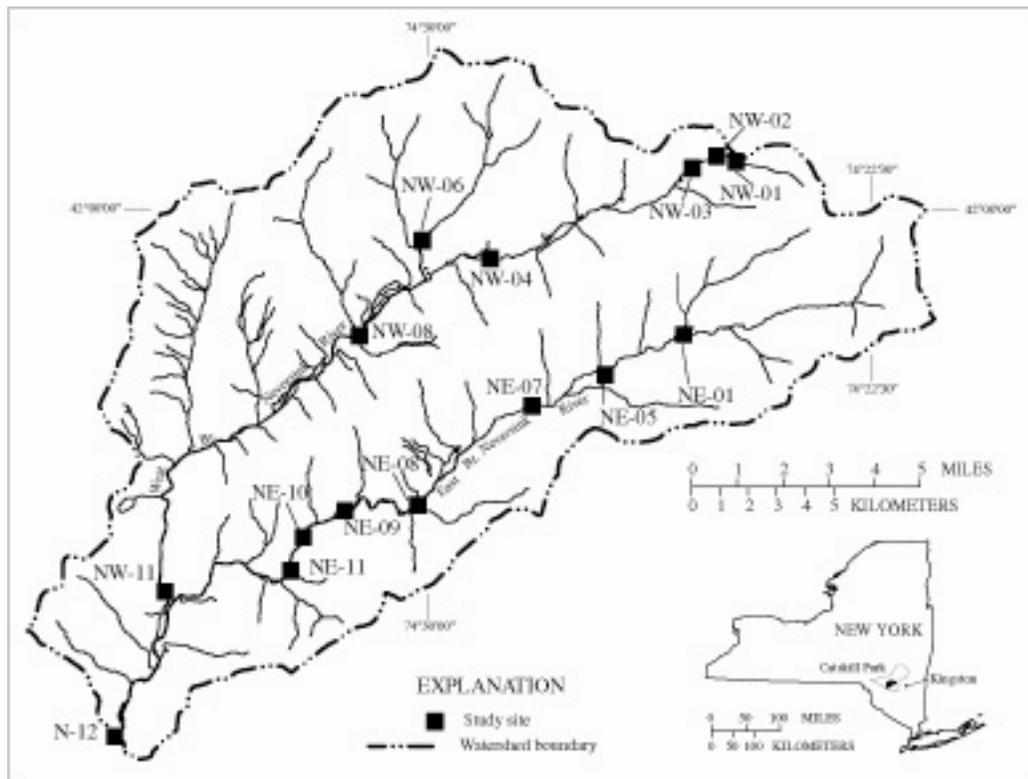
**Table 3** – Drainage area and selected chemistry data for stream sites sampled during 1987 and 2003 in the Neversink River watershed.

<b>Sampling Site Information</b>			<b>1987 Data</b>			<b>2003 Data</b>		
Branch	Site ID	Drainage Area (km <sup>2</sup> )	pH	ANC μeq/L	Al <sub>IM</sub> μmol/L	pH	ANC μeq/L	Al <sub>IM</sub> μmol/L
East	NE-01	20.9	4.96	-10.0	4.9	4.65	-15.3	4.4
	NE-05	25.0	5.09	-8.0	4.9	4.63	-22.5	4.3
	NE-07	32.8	5.51	-2.0	3.3	4.74	-11.7	3.5
	NE-08	45.2				4.98	-6.3	2.6
	NE-09	49.7				5.14	-0.9	1.9
	NE-10	53.1	5.67	24.0	1.3	5.19	-2.1	1.7
	NE-11	59.6	5.82	26.0	0.70	5.66	10.0	1.0
West	NW-01	2.0	4.87	-14.0	8.2	4.78	-10.7	5.9
	NW-02	2.3				4.87	-6.9	5.2
	NW-03	8.2				6.26	25.4	0.8
Trib.	NW-06	9.6	5.96	33.0	0.8	6.23	21.1	0.7
	NW-04	19.7	6.06	26.0	0.7	6.34	28.6	0.7
	NW-08	34.2	6.24	111.0	0.5	6.38	38.5	0.7
	NW-11	84.5	6.57	123.0	0.4	6.62	69.4	0.8
Main	N-12	172.5	6.22	71.0	0.4	6.49	52.7	0.7

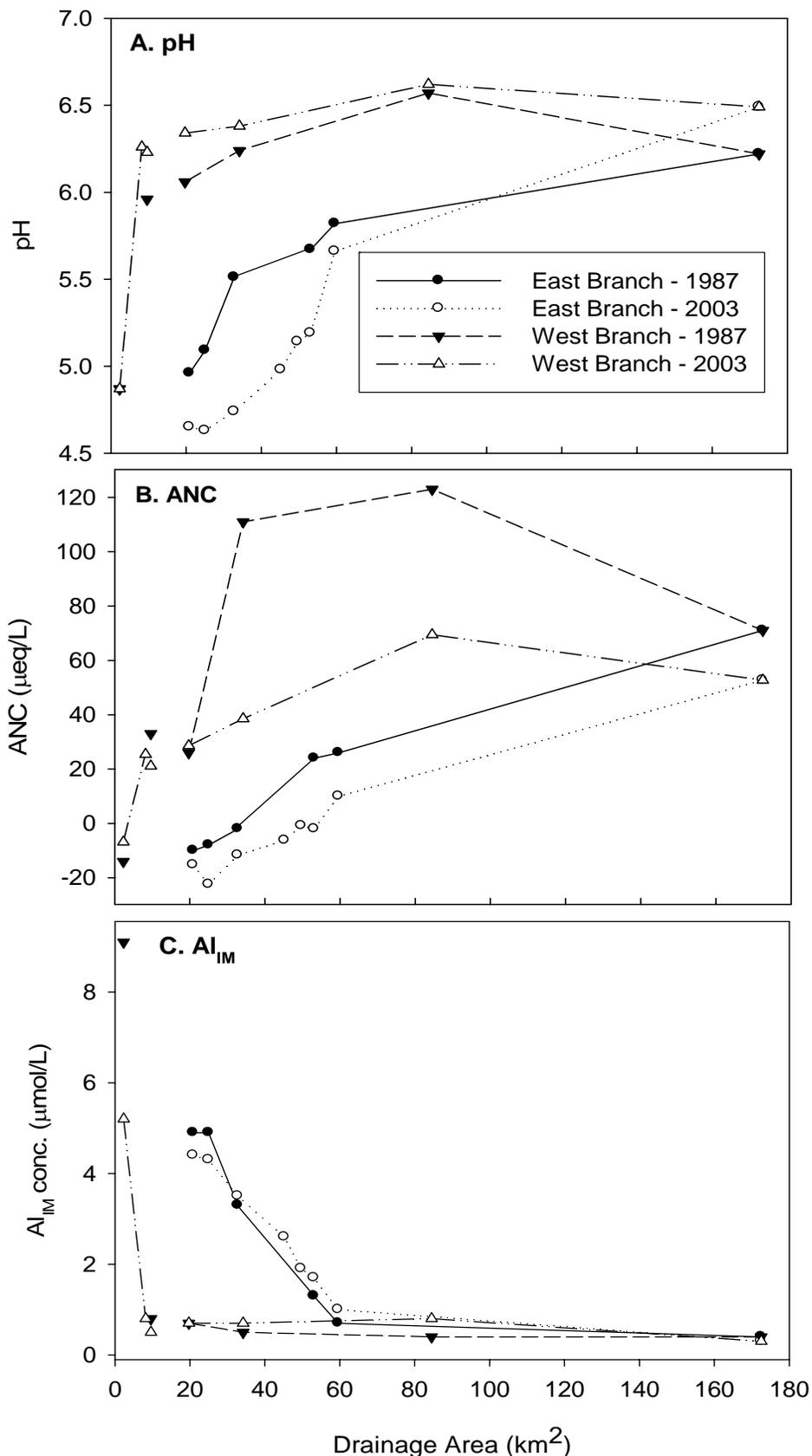
**Table 4** - Fish, diatom, and macroinvertebrate data for stream sites sampled during August 1987 and September 2003 in the Neversink River watershed. Fish occurrences are indicated for selected acid-sensitive species brook trout (*Salvelinus fontinalis*) and slimy sculpin (*Cottus cognatus*) as follows: 1 = present; 0 = absent; and - if not sampled.

<b>Branch</b>	<b>Site ID</b>	<b>Year</b>	<b>Age 0 Brook Trout</b>	<b>Adult Brook Trout</b>	<b>Slimy Sculpin</b>	<b>Diatom Acid Tolerance Index</b>	<b>Acid BAP</b>
East	NE-01	1987	1	1	0	-	0
		2003	-	-	-	76	1.92
	NE-05	1987	1	1	0	-	0
		2003	1	1	0	56	2.08
	NE-07	1987	-	-	-	-	0.65
		2003	1	1	0	74	1.88
	NE-08	1987	-	-	-	-	-
		2003	1	1	1	88	3.63
	NE-09	1987	-	-	-	-	-
		2003	1	1	1	82	5.28
	NE-10	1987	-	-	-	-	7.83
		2003	1	1	1	88	7.35
NE-11	1987	0	1	1	-	8.04	
	2003	1	1	1	83	9.06	
West	NW-01	1987	0	0	0	-	2.47
		2003	0	1	0	93	3.63
	NW-04	1987	0	1	1	-	7.37
		2003	1	1	1	47	7.58
Trib.	NW-06	1987	-	-	-	-	8.24
		2003	-	-	-	16	6.72
	NW-08	1987	-	-	-	-	7.58
		2003	0	1	1	5	9.22
	NW-11	1987	0	1	1	-	9.27
		2003	1	1	1	2	9.75
N-12	1987	-	-	-	-	6.99	
	2003*	1	1	1	13	8.85	

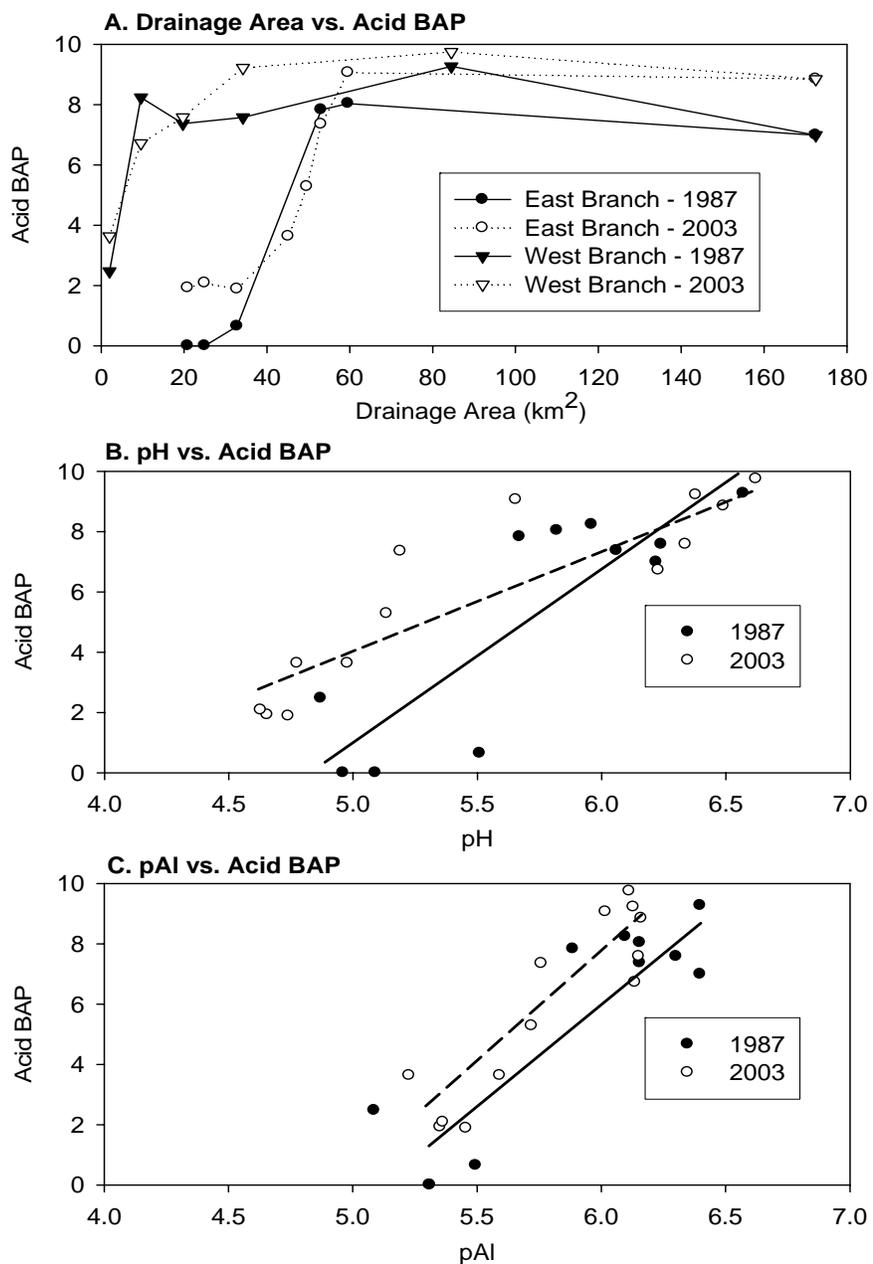
\*fish data collected in July 2003 by B.P. Baldigo.



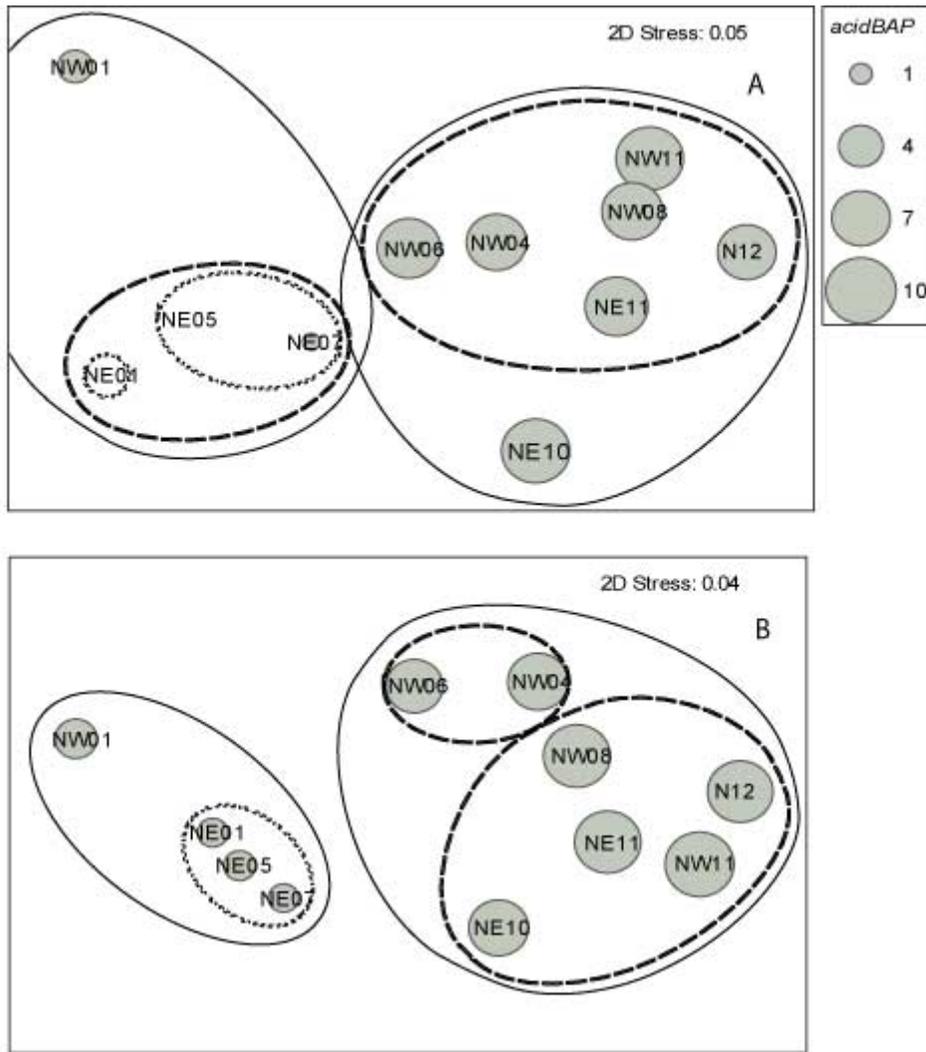
**Figure 1** – Map of upper Neversink River watershed showing sites for biological and chemical sampling.



**Figure 2** – Values of A. pH, B. ANC, and C. Al<sub>IM</sub> concentrations as a function of drainage area for samples collected in the upper Neversink River watershed during August 1987 and September 2003. Draft Version of Tables and Figures, Do not cite until paper is accepted for publication



**Figure 3** – Acid BAP as a function of A. Drainage area, B. pH, and C. pAl (negative log of the inorganic monomeric aluminum concentration) for samples collected in the upper Neversink River watershed in August 1987 and September 2003. The solid and dashed lines in B. and C. represent least squares linear regression relations fit to the 1987 and 2003 data, respectively.



**Figure 4** – Ordination plots (non-metric multi-dimensional scaling) based on macroinvertebrate relative abundances (square-root transformation) from A. August 1987, and B. September 2003. Bubble sizes represent relative sizes of Acid BAP values. Contours denote statistically significant group membership ( $p < 0.05$ ), based on group-averaged cluster analysis of Bray-Curtis similarities. Solid, dashed, and dotted lines represent 30, 40, and 50 percent similarity, respectively.