# Acid Rain Monitoring Project

Bozrah Brook, Hawley, MA – April 7 2013

# FY13 Annual Report

**June 21, 2013**

**Funded by the MA Department of Environmental Protection**
**Bureau of Waste Prevention**

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## Introduction

This report covers the period July 1, 2012 to June 30, 2013, the twelfth year of Phase IV of the Acid Rain Monitoring Project. Phase I began in 1983 when about one thousand citizen volunteers were recruited to collect and help analyze samples from nearly half the state's surface waters. In 1985, Phase II aimed to do the same for the rest of the streams and ponds[1] in Massachusetts. The third phase spanned the years 1986-1993 and concentrated on a subsample of streams and ponds to document the effects of acid deposition to surface waters in the state. Over 800 sites were followed in Phase III, with 300 citizen volunteers collecting samples and doing pH and ANC analyses. In 2001, the project was resumed on a smaller scale: about 60 volunteers are now involved to collect samples from approximately 150 sites, 26 of which are long-term sites with ion and color data dating back to Phase I. In the first years of Phase IV (2001-2003), 161 ponds were monitored for 3 years. Between Fall 2003 and Spring 2010, the project monitored 151 sites twice a year, mostly streams, except for the 26 long-terms sites that are predominantly ponds. Since 2011, reduced funding eliminated our October sampling and monitoring now occurs in April only. In 2011, we also stopped monitoring some of the streams in order to add and revisit ponds that were monitored in 2001-2003. This year is the third year of monitoring for those added ponds.

## Goals

The goals of this project are to determine the overall trend of sensitivity to acidification in Massachusetts surface waters and whether the 1990 Clean Air Act Amendment has resulted in improved water quality.

## Methods

The sampling design was changed in 2011 to monitor both streams and ponds, and that design was continued in 2012 and 2013. In 2001-2003 mostly ponds were monitored. In Fall 2003 the sampling scheme switched to streams to evaluate their response to air pollution reductions. In 2011 the site list was modified to include both ponds and streams. Half of the streams monitored since 2003 were kept, and half of the ponds monitored in 2001-2003 were added back. The streams that were removed were chosen randomly within each county. Ponds that were reinstated on the sampling list were chosen at random within those counties, by ease of accessibility, to replace the removed streams. Because those sites were not chosen with a preconceived plan, they can be considered picked at random.

One collection took place this year, on April 7, 2013.

Methods were unchanged from previous years: Volunteer collectors were contacted six weeks before the collection to confirm participation. Clean sample bottles were sent to them in the mail, along with sampling directions, a field sheet/chain of custody form, and directions including GPS coordinates and maps to the sampling sites. Volunteers collected a surface water sample at their sampling sites either from the bank or wading a short distance into the water body. They collected water one foot below the surface, upstream of their body, after rinsing their sample bottle three times with pond or stream water. If collecting by a bridge, they collected upstream of the bridge unless safety and access did not allow it. They filled in their field data sheet with date, time, and site code information, placed their samples on ice in a cooler and delivered the samples to their local laboratory right away. They were instructed to collect their samples as close to the lab analysis time as possible. In a few cases, samples were collected the day prior to analysis because the lab is not open on traditional "ARM Sunday." Previous studies by our research team have established that pH does not change significantly when the samples are refrigerated and stored in the dark.

[1] Note: The term stream in this report refers to lotic waters (from creeks to rivers) and the term ponds refers to lentic waters (lakes and ponds, but not marshes)

Volunteer labs were sent any needed supplies (sulfuric acid titrating cartridge, electrode, buffers), two quality control (QC) samples, aliquot containers for long-term site samples, and a lab sheet one week to ten days before the collection. They analyzed the first QC sample (an unknown) in the week prior to the collection and called in their results to the Statewide Coordinator. If QC results were not acceptable, the volunteer analyst discussed possible reasons with the Statewide Coordinator and made modifications until the QC sample analysis gave acceptable results. On collection day or the day after, volunteer labs analyzed the second QC sample before and after the regular samples, and reported the results on their lab sheet along with the regular samples. Analyses were done on their pH-meters with KCl-filled combination pH electrodes. Acid neutralizing capacity (ANC) was measured with a double end-point titration to pH 4.5 and 4.2. Most labs used a Hach digital titrator for the ANC determination, but some used traditional pipette titration equipment. Aliquots were taken from the 26 long-term sites to fill two 60mL bottles and one 50mL tube per site for later analysis of ions and color. These aliquots were kept refrigerated until retrieval by UMass staff.

Aliquots, empty bottles, and results were collected by the ARM Statewide Coordinator between one and three days after the collection. The Cape Cod National Seashore lab mailed those in, with aliquot samples refrigerated in a cooler with dry ice.

The Statewide Coordinator reviewed the QC results for all labs and flagged data for any lab results that did not pass Data Quality Objectives (within 0.3 units for pH and within 3mg/L for ANC). pH and ANC data were entered by one ARM staff and proofread by another. Data were entered in a MS excel spreadsheet and uploaded into the web-based database at http://63.135.115.71/acidrainmonitoring/. Data were also posted on the ARM web page at http://wrrc.umass.edu/research/acid-rain-monitoring-project. Note that ARM data is also available on the national CUAHSI database, via Hydro Desktop (http://cuahsi.org/HIS.aspx).

Water Resources Research Center's Elizabeth Finn managed the Environmental Analysis Lab (EAL) and provided the QC samples for pH and ANC to all of the volunteer labs. EAL also provided analysis for pH and ANC for samples from Hampshire and Franklin Counties, and color analysis for the long-term site samples. New this year, the UMass Extension Soils Laboratory, under the direction of Dr. John Spargo, analyzed the samples from the long-term sites for cations, and University of New Hampshire's Water Quality Analysis Laboratory, under the direction of Jody Potter, analyzed the samples from the long-term sites for anions.

Aliquots for 25 long-term sites (one sample was accidentally emptied by the volunteer lab staff before taking aliquots for ion analyses) were analyzed for color on a spectrophotometer within one day; anions within one month on an Ion Chromatograph; and cations within two months on an ICP at the UMass Extension Soils Laboratory on the UMass Amherst campus. The data was sent via MS Excel spreadsheet to the Statewide Coordinator who uploaded it into the web-based database.

The Statewide Coordinator and the Project Principal Investigator plotted the data to check for data inconsistencies and gaps. They then analyzed the April data from 1983 through 2013, using the statistical software JMP (http://www.jmp.com/software/) to run bivariate analyses of pH, ANC, ions, and color against date. This yielded trends analyses with a fitted X Y line, using a 95% confidence interval.

**Results**

1. There were 150 sites to be monitored, 77 ponds and 73 streams. Of those, 19 ponds and 7 streams are "long-term" sites that are sampled every year and analyzed for color and a suite of ions in addition to pH and ANC.

2. Sampling was completed for 147 sites (77 ponds and 70 streams) including 25 of our long-term sites.

3. The only quality control problem this year was the UMass Boston laboratory not passing our quality control samples. The data from those samples is considered to be unreliable and is therefore removed from the statistical analysis. We had valid pH and ANC data for 134 sites. One long term site sample was accidentally emptied before taking aliquots, resulting in valid data for only 25 sites for color and ions.

4. The network of volunteers was maintained and kept well informed on the condition of Massachusetts surface waters so that they would be able to participate effectively in the public debate. This was accomplished by e-mail and telephone communications, as well as through updates via an internet list-serv. 53 volunteers participated in this year's collection. Several new volunteer collectors were recruited to replace ill or retiring volunteers via several internet listservs and by word of mouth. There were 10 volunteer labs across the state, in addition to the EAL at UMass Amherst, in charge of pH and ANC analyses (Table 1).

**Table 1: Volunteer Laboratories**

| Analyst Name | Affiliation | Town |
|---|---|---|
| Joseph Ciccotelli | Ipswich Water Treatment Dept | Ipswich |
| Nicole Henderson | UMass Boston Environmental Studies Program | Boston |
| Sherrie Sunter | MDC Quabbin Lab | Belchertown |
| Dave Bennett | Cushing Academy | Ashburnham |
| Holly Bayley | Cape Cod National Seashore | South Wellfleet |
| Robert Caron | Bristol Community College | Fall River |
| Bob Bentley | Analytical Balance Labs | Carver |
| David Christensen | Biology Dept. Wilson Hall WSC | Westfield |
| Jim Bonofiglio | City of Worcester Water Lab | Holden |
| Carmen DeFillippo | Pepperell Waste Water Treatment Plant | Pepperell |
| Beckie Finn, Brooke Andrew | University of Massachusetts Environmental Analysis Lab | Amherst |

5. The ARM web site and searchable database were maintained and updated. 2013 pH, ANC, ions and color data that met data quality objectives were added to the web database via the uploading tool created in previous years. The database was evaluated for quality control and uploading errors were corrected. Note that our website is migrating to a new address (www.wrrc.umass.edu).

6. The data collected was analyzed for trends in pH and ANC in April months (134 sites) and for color and ions (25 sites), using the JMP® Statistical Discovery Software (http://www.jmp.com/software/). Trend analyses (scatter plots, regression, and correlation) were run on pH, ANC, each ion, and color separately, predicting concentration vs. time.

## Data Analysis Results

### pH and ANC

#### Trend analysis for pH and ANC

Table 2 displays the number of sites out of a maximum of 136 that show a significant change over time for pH or ANC. If the difference was not statistically significant ($p>0.05$), the sites are tabulated in the 'No Change' category.

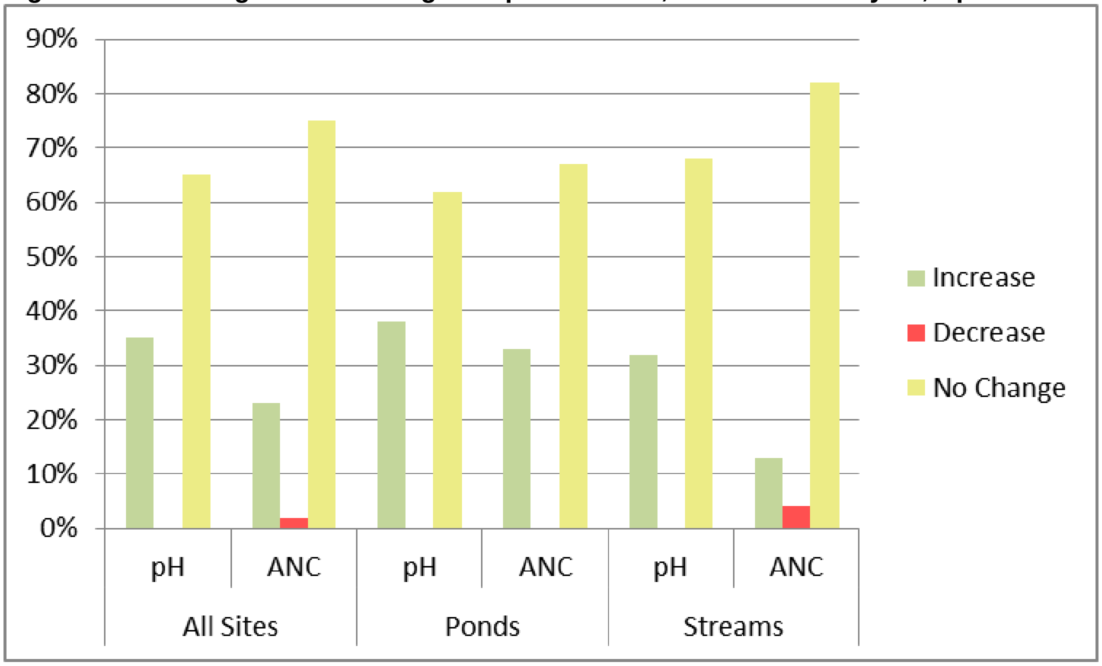
**Table 2: Trend analysis results for pH and ANC, April 1983 – April 2013**

| | All Sites | | Ponds | | Streams | |
|---|---|---|---|---|---|---|
| | pH | ANC | pH | ANC | pH | ANC |
| Increased | 47 | 31 | 25 | 22 | 22 | 9 |
| Decreased | 0 | 3 | 0 | 0 | 0 | 3 |
| No Change | 87 | 100 | 41 | 44 | 46 | 56 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Total | 134 | 134 | 66 | 66 | 68 | 68 |

Those results are also graphed in Figure 1.

**Figure 1. Percentage of site changes in pH and ANC, from trend analysis, April 1983-2013**




This trend analysis indicates that for most sites, neither pH nor ANC changed significantly over time. However, for those sites that show a significant change, many more show an increase than a decrease in value: 35% of the sites saw an increase in pH and 23% had an increase in ANC. We again note a difference between ponds and streams. More ponds (38%) than streams (32%) saw an increase in pH, and for ANC the difference is very noticeable: 33% of ponds increased in ANC while only 13% of streams did, while no ponds decreased in ANC but 4% of streams did.

Now in our third year of monitoring both ponds and streams, we continue to see a positive trend in ponds, which seem to be improving a little more each year. Streams show a lesser improvement, particularly for ANC. This year for the first time in many years, we had a lingering snowpack and our sampling date of April 7 likely caught the snowmelt acid pulse that we try to document by sampling in early spring. It is possible that the acid pulse is more noticeable in streams than ponds due to the more rapid reaction of moving water to precipitation in streams than in ponds.

**Table 3: Comparison of percent of sites showing changes in pH and ANC, 2011-2013**

| **2011** | **All Sites** | | **Ponds** | | **Streams** | |
|---|---|---|---|---|---|---|
| | **pH** | **ANC** | **pH** | **ANC** | **pH** | **ANC** |
| Increased | 28% | 19% | 22% | 17% | 35% | 22% |
| Decreased | 2% | 1% | 1% | 0% | 3% | 3% |
| No Change | 70% | 79% | 76% | 83% | 62% | 75% |
| **2012** | **All Sites** | | **Ponds** | | **Streams** | |
| | **pH** | **ANC** | **pH** | **ANC** | **pH** | **ANC** |
| Increased | 29% | 21% | 28% | 33% | 34% | 23% |
| Decreased | 2% | 2% | 1% | 0% | 4% | 3% |
| No Change | 69% | 78% | 71% | 67% | 62% | 75% |
| **2013** | **All Sites** | | **Ponds** | | **Streams** | |
| | **pH** | **ANC** | **pH** | **ANC** | **pH** | **ANC** |
| Increase | 35% | 23% | 38% | 33% | 32% | 13% |
| Decrease | 0% | 2% | 0% | 0% | 0% | 4% |
| No Change | 65% | 75% | 62% | 67% | 68% | 82% |

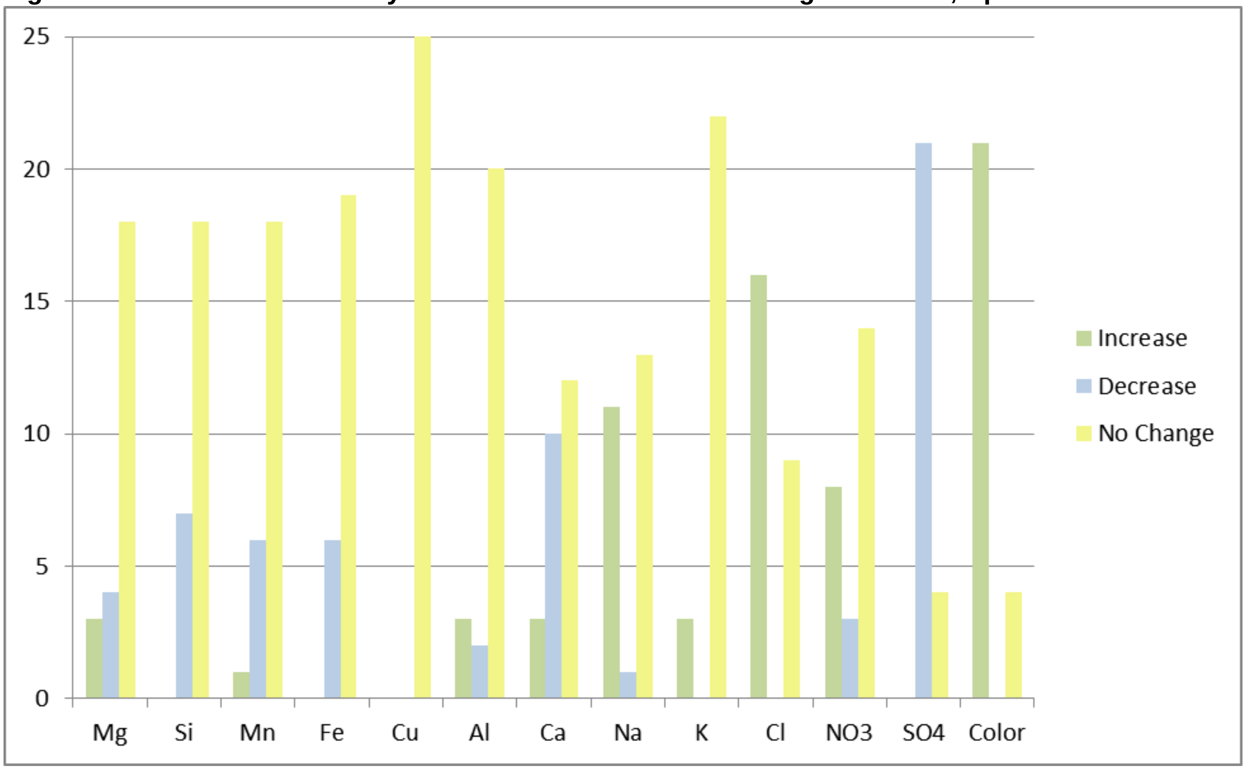
**Ions and Color**
Trend analyses were run for the 25 long-term sites that were analyzed for thirteen ions and color.

Table 4 and Figure 2 show the results of the trend analysis for all parameters.

**Table 4: Trend analysis results for ions and color April 1983 – April 2013**

| | Increase | Decrease | No Change |
|---|---|---|---|
| **Mg** | 3 | 4 | 18 |
| **Si** | 0 | 7 | 18 |
| **Mn** | 1 | 6 | 18 |
| **Fe** | 0 | 6 | 19 |
| **Cu** | 0 | 0 | 25 |
| **Al** | 3 | 2 | 20 |
| **Ca** | 3 | 10 | 12 |
| **Na** | 11 | 1 | 13 |
| **K** | 3 | 0 | 22 |
| **Cl** | 16 | 0 | 9 |
| **NO3** | 8 | 3 | 14 |
| **SO4** | 0 | 21 | 4 |
| **Color** | 21 | 0 | 4 |

**Figure 2: Results of trend analysis for ions and color for 25 long-term sites, April 1983-2013**




Results are similar to previous years, with most cations showing no significant change over the years, or if they do, the change is a decrease more often than an increase, except for Sodium where half the sites show an increase. This is probably tied to the increase of Chloride, due to road salting practices in

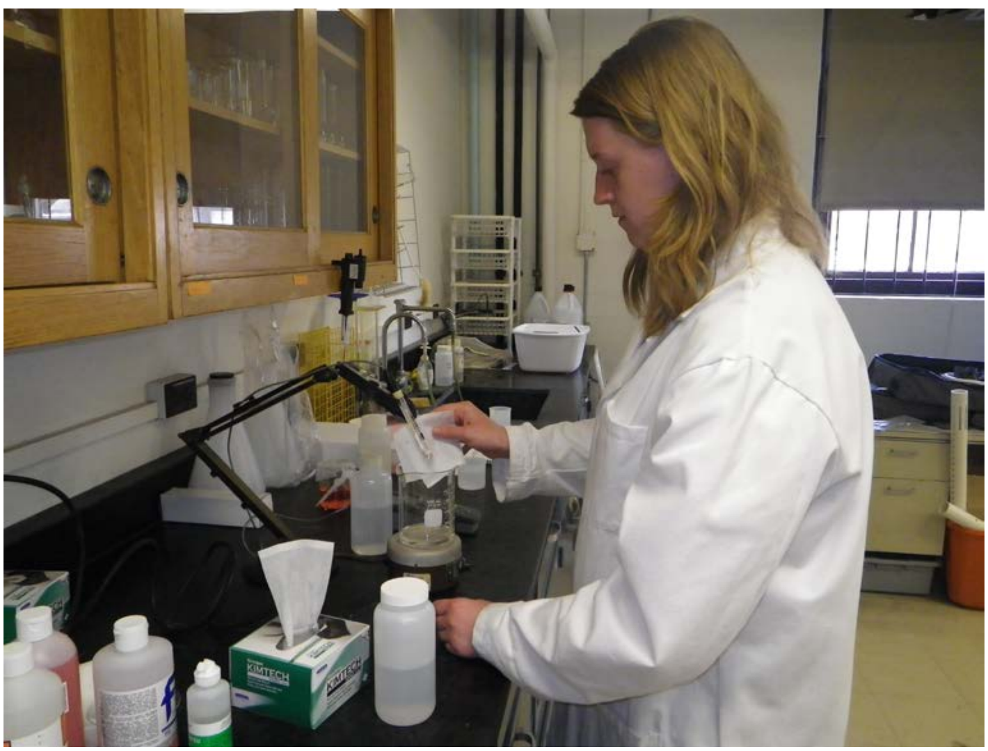
Massachusetts. A minor change this year is some increase in Aluminum and Potassium. We continue to see a very significant downward trend in Sulfate. More sites now show an increase in nitrate, so we reiterate the observation that now that sulfate emissions have been curbed, attention should be paid to decreasing NOx emissions

### Discussion

This year we sampled immediately after a major snowmelt event, when we would expect a pulse of acidity to reach our surface waters. While pH did not seem affected overall, stream alkalinity decreased and could be a result of increased acidity in melt water “consuming” acid neutralizing capacity. Likewise, more sites showed an increase in nitrate this year than in the past. A note of caution that we switched to new laboratories for ions this year. Sulfate results are much lower than previous years, and it is possible that the analytical methods differ enough between the two laboratories that it would explain this marked decrease. We will endeavor to continue using these two laboratories in the future to confirm current trends.

### Acknowledgements

Thank you to all of the project’s volunteers who make this project possible by collecting samples all over the state under any weather conditions, and who spend many hours in the lab analyzing samples. A special thought to our first organizing volunteer Leon Ogrodnik, a key figure in the early years of the Acid Rain Monitoring Project, who passed away in May of this year.




Brooke Andrews, WRRC student employee, analyzing pH and ANC
at the Environmental Analysis Laboratory at the University of Massachusetts

## Appendix

**Table 4: April 2013 ARM Color and Ion Data**

| Name | Palsite | Mg | Si | Mn | Fe | Cu | Al | Ca | Na | K | Cl | NO3_N | SO4 | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shingle Island Brook | 188 | 1.053 | 2.015 | 0.116 | 0.198 | 0.012 | 0.179 | 2.807 | 7.739 | 1.008 | 12.442 | 0.138 | 2.454 | 216 |
| Belmont Reservoir | 21010 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Cobble Mt. Reservoir | 32018 | 0.659 | 3.191 | 0.001 | 0.046 | 0.009 | 0.068 | 1.45 | 3.473 | 0.265 | 5.782 | ND | 1.136 | 175 |
| Hawley Reservoir | 34031 | 0.303 | 3.757 | 0.01 | 0.031 | 0.009 | 0.069 | 1.765 | 3.411 | 0.23 | 5.499 | 0.024 | 1.322 | 55 |
| Wyola Dam | 34103 | 0.267 | 2.837 | 0.005 | 0.064 | 0.008 | 0.078 | 1.526 | 3.061 | 0.315 | 4.031 | 0.048 | 1.065 | 76 |
| Upper Naukeag Lake | 35090 | 0.139 | 0.691 | 0.012 | 0.027 | 0.008 | 0.026 | 0.614 | 6.489 | 0.215 | 9.805 | 0.005 | 0.527 | 72 |
| Crystal Lake | 36043 | 0.165 | 0.006 | 0.013 | 0.016 | 0.015 | 0.023 | 0.588 | 0.665 | 0.355 | 0.952 | 0.001 | 0.61 | 94 |
| Lake Lorraine | 36084 | 0.443 | 0.041 | 0.001 | 0.025 | 0.011 | 0.027 | 2.248 | 12.269 | 0.585 | 18.406 | 0.029 | 1.001 | 50 |
| Quabbin Station | 36129 | 0.482 | 1.005 | 0.001 | 0.016 | 0.009 | 0.017 | 2.189 | 4.364 | 0.397 | 6.418 | 0.003 | 1.414 | 34 |
| Nipmuck Pond | 42039 | 0.123 | 2.853 | 0.012 | 0.017 | 0.011 | 0.177 | 0.752 | 2.524 | 0.081 | 4.024 | ND | 0.674 | 30 |
| N. Watuppa Lake | 61004 | 0.501 | 0.868 | 0.037 | 0.039 | 0.011 | 0.076 | 1.413 | 8.4 | 0.343 | 13.401 | 0.001 | 1.443 | 101 |
| Ashby Reservoir | 81001 | 0.354 | 2.055 | 0.001 | 0.061 | 0.009 | 0.056 | 1.365 | 6.381 | 0.484 | 9.371 | 0.05 | 1.078 | 76 |
| Wright Pond | 81160 | 0.156 | 0.627 | 0.03 | 0.065 | 0.056 | 0.059 | 0.951 | 2.528 | 0.564 | 3.485 | ND | 0.31 | 218 |
| Whitehall Reservoir | 82120 | 0.891 | 0.048 | ND | 0.026 | 0.008 | 0.017 | 3.029 | 15.041 | 0.826 | 23.786 | ND | 1.536 | 108 |
| Hedges Pond | 94065 | 1.224 | 0.152 | 0.004 | 0.018 | 0.008 | 0.026 | 0.992 | 8.476 | 0.716 | 14.991 | ND | 1.555 | 87 |
| College Pond | 95030 | 0.619 | 0.213 | 0.002 | 0.027 | 0.008 | 0.014 | 0.72 | 3.482 | 0.281 | 5.184 | ND | 1.02 | 86 |
| Ezekiel Pond | 95051 | 0.796 | 0.031 | 0.003 | 0.022 | 0.008 | 0.031 | 1.454 | 11.581 | 0.591 | 18.613 | 0.03 | 1.21 | 73 |
| Little Sandy Pond | 95092 | 0.604 | 0.092 | 0.025 | 0.019 | 0.006 | 0.028 | 0.81 | 8.135 | 0.548 | 13.767 | 0.115 | 0.965 | 58 |
| Great Pond | 96117 | 2.042 | 0.021 | 0.017 | 0.015 | 0.008 | 0.014 | 0.997 | 15.952 | 0.788 | 26.389 | ND | 2.144 | 42 |
| Kinnacum Pond | 96163 | 0.975 | 0.014 | 0.027 | 0.027 | 0.007 | 0.046 | 0.315 | 7.721 | 0.46 | 13.9 | 0.019 | 0.719 | 70 |
| Caldwell Creek | 3626575 | 0.551 | 3.959 | 0.012 | 0.027 | 0.01 | 0.08 | 1.791 | 6.238 | 0.206 | 9.618 | 0.001 | 1.985 | 164 |
| W. Branch Swift River | 3626800 | 0.298 | 3.082 | 0.013 | 0.034 | 0.011 | 0.098 | 1.321 | 2.655 | 0.316 | 3.377 | ND | 1.603 | 56 |
| E. Branch Swift River | 3627200 | 0.449 | 2.24 | 0.001 | 0.05 | 0.007 | 0.068 | 1.925 | 5.337 | 0.541 | 8.253 | 0.009 | 1.49 | 96 |
| Rattlesnake Brook | 6235125 | 0.408 | 2.68 | 0.036 | 0.125 | 0.011 | 0.202 | 0.949 | 5.301 | 0.292 | 7.882 | ND | 1.601 | 139 |
| Angeline Brook | 9560000 | 0.96 | 1.554 | 0.011 | 0.125 | 0.008 | 0.335 | 1.584 | 6.113 | 0.517 | 10.395 | 0.029 | 1.76 | 350 |
| Bread & Cheese Brook | 9560150 | 1.617 | 1.925 | 0.004 | 0.132 | 0.009 | 0.149 | 4.544 | 30.004 | 4.096 | 41.649 | 0.451 | 4.326 | 313 |

NA= Not analyzed   ND= Not Detected

Table 5: pH and ANC, all sampling sites, April 2013

| PALSITE | NAME | TOWN | pH | Alkalinity |
|---|---|---|---|---|
| 188 | Shingle Island Brook | Freetown | 5.84 | 1.3 |
| 371 | Beagle Club Pond | Dartmouth | 6.93 | 10.9 |
| 11002 | Cheshire Res. North | Cheshire | 8.06 | 105 |
| 21010 | Belmont Reservoir | Hinsdale | 5.93 | 1.4 |
| 21040 | Lake Garfield | Monterey | 7.77 | 42 |
| 21062 | Long Pond | Great Barrington | 7.69 | 72.7 |
| 31042 | Trout Pd 2; Demming Pd | Tolland | 5.82 | 2.3 |
| 31044 | Upper Spectacle Pond | Sandisfield | 6.53 | 7.7 |
| 32012 | Buck Pond | Westfield | 7.02 | 18.8 |
| 32018 | Cobble Mtn. Reservoir | Blandford | 6.36 | 2.1 |
| 33001 | Ashfield Pd;Ashfield L; | Ashfield | 7.19 | 33.7 |
| 33003 | Bog Pond; Anthony Pond | Savoy | 6.36 | 2.4 |
| 33017 | Plainfield Pond | Plainfield | 6.19 | 1 |
| 34011 | Brass Mill Pond | Williamsburg | 6.94 | 9.1 |
| 34023 | Fiske Pond | Wendell | 5.24 | -0.1 |
| 34031 | Hawley Reservoir | Pelham | 6.09 | 1.83 |
| 34080 | Scarboro Pond | Belchertown | 6.19 | 2.6 |
| 34103 | Lake Wyola; Locks Pond | Shutesbury | 6.01 | 3.2 |
| 35002 | Bassett Pond | New Salem | 5.85 | 1 |
| 35013 | Cowee Pd;Marm Johns Pd | Gardner | 5.11 | 0.1 |
| 35017 | Lake Denison | Winchendon | 5.94 | 2.5 |
| 35026 | Greenwood Pond | Templeton | 5.26 | 0.4 |
| 35048 | Moores Pond; Lake Moore | Warwick | 5.96 | 2.2 |
| 35085 | Stump Pond | Gardner | 4.89 | -0.4 |
| 35089 | Tully Pond | Orange | 6.67 | 3.8 |
| 35090 | Upper Naukeag Lake | Ashburnham | 5.88 | 0.6 |
| 35095 | Lake Watatic | Ashburnham | 5.79 | 2.5 |
| 35107 | L Rohunta; South Basin | Athol | 6.48 | 3 |
| 36015 | Bickford Pd;Ropers Res | Hubbardston | 5.98 | 1.9 |
| 36036 | Cloverdale Street Pond | Rutland | 6.47 | 7.08 |
| 36043 | Crystal Lake | Palmer | 5.54 | 0.15 |
| 36084 | Lake Lorraine | Springfield | 6.83 | 7.9 |
| 36129 | Quabbin Res. Stattion 202 | Belchertown | 6.59 | 3.77 |
| 36155 | Thompsons Pond | Spencer | 6.48 | 4.83 |
| 41014 | East Brimfield Res | Brimfield | 6.81 | 6.88 |
| 42039 | Nipmuck Pond | Webster | 5.67 | <1.49 |
| 51024 | Coes Reservoir | Worcester | 6.92 | 12.6 |
| 51063 | Holden Res 1;Upper Hold | Holden | 6.26 | 2.24 |
| 51090 | Lynde Brook Reservoir | Leicester | 6.74 | 10.3 |
| 51179 | Wallis Res | Douglas | 6.02 | <1.49 |
| 52032 | Plain Street Pond | Mansfield | 6.71 | 10.05 |
| 61004 | North Watuppa Lake | Fall River | 5.89 | 0.65 |
| 62048 | County Road Pond | Berkley | 6.54 | 8.5 |
| 62097 | Johnson Pd; Factory Pd | Raynham | 6.36 | 2.45 |
| 62213 | Winnecunnet Pd;Winnecon | Norton | 6.8 | 9 |

| | | | | |
|---|---|---|---|---|
| 81001 | Ashby Reservoir | Ashby | 6.45 | 3 |
| 81053 | Grove Pond | Ayer | 7.08 | 14.85 |
| 81056 | Heald Pond | Pepperell | 6.72 | 13.75 |
| 81100 | Phoenix Pond; Double Pd | Shirley | 6.75 | 22.4 |
| 81111 | Robbins Pond | Harvard | 7.8 | 52.6 |
| 81117 | Sandy Pond | Ayer | 6.75 | 9 |
| 81151 | L Wampanoag; Nashua Res | Ashburnham | 5.04 | 0.2 |
| 81160 | Wright Pd; Upper Wright | Ashby | 5.51 | 1.8 |
| 84072 | Upper Attitash Pond | Amesbury | 7.52 | 21 |
| 84083 | Duck Pond | Groton | 6.31 | 6.65 |
| 94065 | Hedges Pond | Plymouth | 6.03 | 1.4 |
| 94072 | Indian Pond | Kingston | 6.77 | 11.3 |
| 95030 | College Pond | Plymouth | 6.56 | 2.8 |
| 95051 | Ezekiel Pond | Plymouth | 6.55 | 2.3 |
| 95092 | Little Sandy Pond | Plymouth | 5.88 | 0.2 |
| 95112 | New Long Pond | Plymouth | 6.24 | 1.6 |
| 95142 | Spectacle Pond | Wareham | 6.65 | 3.8 |
| 95151 | Turner Pd;Turners Mill | New Bedford | 5 | -0.2 |
| 95170 | Noquockoke L;South Basi | Dartmouth | 6.23 | 1.9 |
| 96117 | Great Pond | Wellfleet | 5.41 | -0.2 |
| 96163 | Kinnacum Pond | Wellfleet | 4.84 | -0.8 |
| 96264 | Round Pond | Brewster | 5.91 | 1.2 |
| 2103725 | Soda Creek | Sheffield | 7.45 | 31.4 |
| 2104100 | Williams River | West Stockbridge | 8.24 | 121.8 |
| 2104200 | Sleepy Hollow Brook | Richmond | 8.1 | 174.2 |
| 2105350 | Barton Brook | Dalton | 7.5 | 26.7 |
| 2105425 | Anthony Brook | Dalton | 6.74 | 5.7 |
| 2105700 | Kilburn Brook | Peru | 7 | 6.3 |
| 2105725 | Cady Brook | Washington | 7.09 | 14.1 |
| 2105750 | Bilodeau Brook | Hinsdale | 7.25 | 19.4 |
| 3106825 | Fox Brook | Granville | 6.59 | 4.9 |
| 3107700 | Valley Brook | Granville | 6.16 | 1.4 |
| 3208725 | Little River | Westfield | 6.9 | 9.3 |
| 3210300 | Walker Brook | Becket | 6.98 | 9.5 |
| 3313175 | Hinsdale Brook | Shelburne | 7.82 | 45.5 |
| 3313850 | Shingle Brook | Shelburne | 7.58 | 55.3 |
| 3314100 | North River | Colrain | 7.16 | 19.2 |
| 3314450 | Kinsman Brook | Heath | 7.06 | 10.8 |
| 3314550 | Vincent Brook | Colrain | 7.28 | 13 |
| 3314650 | Underwood Brook | Heath | 6.62 | 3.1 |
| 3314925 | East Oxbow Brook | Charlemont | 6.64 | 4.2 |
| 3315075 | Hartwell Brook | Charlemont | 7.3 | 22.4 |
| 3315325 | Bozrah Brook | Hawley | 7.33 | 12.9 |
| 3316050 | Todd Brook | Charlemont | 6.06 | 3.1 |
| 3316550 | Lord Brook | Rowe | 6.6 | 3.4 |
| 3417750 | Bagg Brook | West Springfield | 8.57 | 96.4 |
| 3419825 | Mill River | Conway | 7.33 | 34.6 |
| 3522675 | Black Brook | Warwick | 6.33 | 1.9 |

| | | | | |
|---|---|---|---|---|
| 3523750 | Kenny Brook | Royalston | 5.94 | 1.1 |
| 3523825 | Beaman Brook | Winchendon | 5.87 | 1.4 |
| 3523950 | Wilder Brook | Gardner | 5.29 | 0.5 |
| 3524050 | Baker Brook | Gardner | 5.6 | 1.7 |
| 3524200 | Towne Brook | Royalston | 5.23 | 0.1 |
| 3524250 | Robbins Brook | Winchendon | 5.57 | 0.9 |
| 3625975 | Sucker Brook | New Braintree | 6.64 | 4.88 |
| 3626475 | Maynard Brook | Oakham | 5.81 | <1.49 |
| 3626575 | Cadwell Creek | Pelham | 6.1 | 1.04 |
| 3626800 | West Br Swift River | Shutesbury | 5.61 | 1.2 |
| 3627000 | Hop Brook | New Salem | 6.77 | 5.2 |
| 3627200 | East Br Swift River | Barre | 6.1 | 1.4 |
| 3627500 | Flat Brook | Ware | 6.63 | 6.9 |
| 3628175 | West Br Ware River | Hubbardston | 6.17 | 1.94 |
| 4230075 | French River | Oxford | 6.89 | 10.7 |
| 4230325 | Wellington Brook | Oxford | 6.57 | 17.6 |
| 5131275 | Round Meadow Brook | Mendon | 6.31 | 3.47 |
| 5131425 | Aldrich Brook | Millville | 6.43 | 5 |
| 5132600 | Sewall Brook | Boylston | 7.16 | 14.5 |
| 5132625 | Cronin Brook | Grafton | 6.79 | 9.45 |
| 5132700 | Dorothy Brook | Worcester | NS | NS |
| 5233750 | Bungay River | North Attleborough | 6.55 | 23.6 |
| 5334075 | Torrey Creek | Seekonk | 6.38 | 13.25 |
| 5334100 | Rocky Run | Rehoboth | 6.42 | 7.3 |
| 5334150 | Clear Run Brook | Seekonk | 7.32 | 27.7 |
| 6134500 | Kickamuit River | Swansea | 6.65 | 7.8 |
| 6134700 | Blossom Brook | Fall River | 4.59 | -0.7 |
| 6134725 | King Phillip Brook | Fall River | 4.59 | -0.75 |
| 6235125 | Rattlesnake Brook | Freetown | 4.66 | -0.85 |
| 6235775 | Mulberry Meadow | Easton | 6.75 | 7.05 |
| 6235800 | Beaver Brook | Easton | 6.72 | 10.4 |
| 6236100 | Bassett Brook | Raynham | 6.28 | 5.1 |
| 7240375 | Godfrey Brook | Milford | NS | NS |
| 8143675 | Gulf Brook | Pepperell | 7.03 | 12.15 |
| 8143825 | Robinson Brook | Pepperell | 7.26 | 24.6 |
| 8144725 | Mcgovern Brook | Lancaster | NS | NS |
| 8146000 | Bartlett Pond Brook | Leominster | 5.39 | <1.49 |
| 8247475 | Millham Brook | Marlborough | 7.08 | 25.7 |
| 9253500 | Ipswich River | Ipswich | 6.93 | 24 |
| 9253700 | Black Brook | Hamilton | 6.84 | 20 |
| 9253925 | Boston Brook | Middleton | 6.87 | 16.4 |
| 9560000 | Angeline Brook | Westport | 4.86 | -0.3 |
| 9560150 | Bread And Cheese Brook | Westport | 6.28 | 2.1 |
| 9661525 | Hatches Creek | Eastham | 6.06 | 8 |

NS = Not sampled