

## Limekiln Lake

### Location

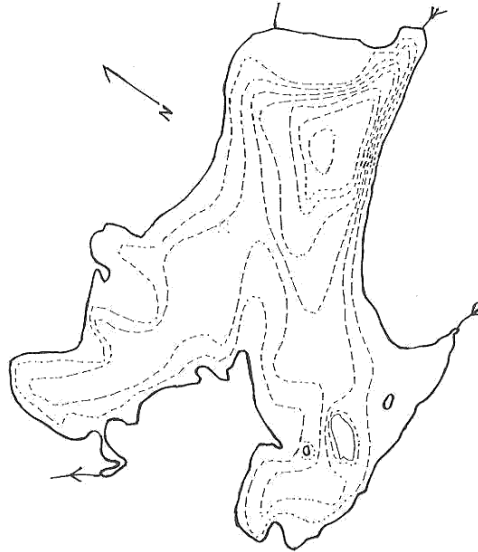
Pond Number: 040826  
Watershed: Black River  
County: Hamilton  
Topographic Quadrangle: Old Forge

### Sample Site

Latitude: 43° 42.816'  
Longitude: 74° 47.588'

### Morphometry

Surface Area: 462 Ac.  
Mean Depth: 20 Ft.  
Maximum Depth: 72 Ft.  
Volume: 9,240 Ac./Ft.  
Watershed Area: 2,580 Ac.  
Hydraulic Retention Time: 1.4 Yr.  
Shoreline Length: 6.2 Mi.  
Elevation: 1,890 Ft.  
Water Quality Classification: A (T)



## Temperature and Dissolved Oxygen

Limekiln Lake had a minimum DO of 0.8 mg/L (October 1994), with a minimum temperature of 5.2°C and a maximum temperature of 23.7°C. In general, the lowest DO values occurred during the months of September and October.

## pH

Figure 124 presents the seasonal mean pH trend in Limekiln Lake, while Table 97 presents descriptive statistics for pH in Limekiln Lake. The pH in Limekiln Lake exhibited an increasing trend from 1996 to 1999, followed by generally stable values. The pH in Limekiln Lake was slightly lower than the county average from 1993 to 1998, slightly higher in 1999 and 2000, and similar to the county average in 2002 and 2003, though any differences were not statistically significant.

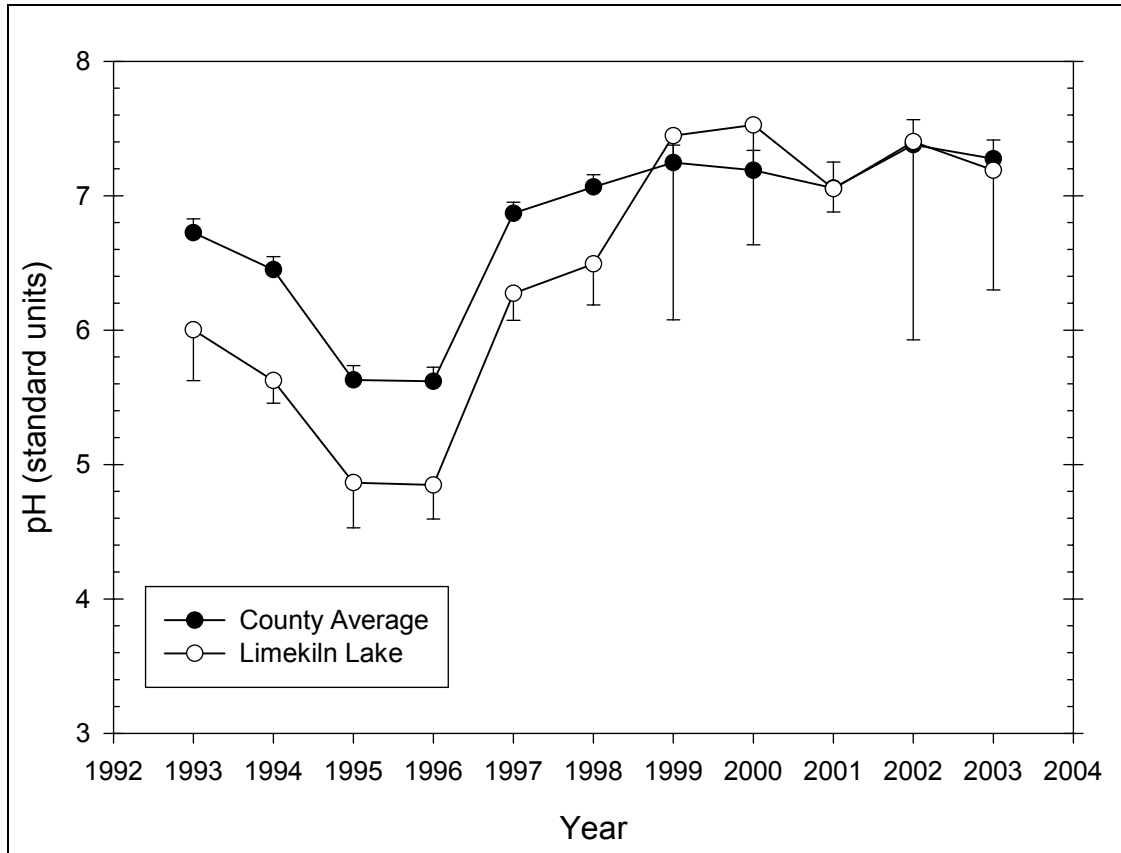


Figure 124 Seasonal mean pH trend in Limekiln Lake

Table 97 – Descriptive Statistics for pH in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.002	0.303	0.136	0.377
1994	6	0	5.625	0.161	0.0658	0.169
1995	6	0	4.865	0.319	0.130	0.335
1996	6	0	4.848	0.241	0.0983	0.253
1997	6	0	6.273	0.190	0.0777	0.200
1998	6	0	6.492	0.290	0.118	0.304
1999	5	0	7.446	1.103	0.493	1.370
2000	6	0	7.527	0.850	0.347	0.892
2001	4	0	7.053	0.109	0.0544	0.173
2002	4	0	7.402	0.927	0.464	1.475
2003	4	0	7.190	0.560	0.280	0.890
Year	Range	Max	Min	Median	25%	75%
1993	0.700	6.350	5.650	5.930	5.762	6.297
1994	0.450	5.860	5.410	5.615	5.520	5.730
1995	0.860	5.270	4.410	4.915	4.610	5.070
1996	0.610	5.180	4.570	4.850	4.630	5.010
1997	0.520	6.430	5.910	6.305	6.270	6.420
1998	0.840	7.020	6.180	6.415	6.350	6.570
1999	2.900	8.900	6.000	7.620	6.600	8.158
2000	2.140	8.640	6.500	7.660	6.610	8.090
2001	0.220	7.160	6.940	7.055	6.960	7.145

2002	2.210	8.530	6.320	7.380	6.720	8.085
2003	1.170	7.710	6.540	7.255	6.725	7.655
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1993	0.170	-2.443	0.220	0.500	30.010	180.488
1994	0.205	-0.583	0.157	0.734	33.750	189.974
1995	-0.291	-1.093	0.197	0.556	29.190	142.519
1996	0.191	-1.784	0.193	0.579	29.090	141.328
1997	-1.771	3.597	0.326	0.045	37.640	236.310
1998	1.385	2.478	0.227	0.391	38.950	253.271
1999	-0.0354	-0.351	0.163	0.724	37.230	282.082
2000	-0.117	-1.587	0.193	0.580	45.160	343.516
2001	-0.0504	-4.979	0.262	0.379	28.210	198.987
2002	0.130	0.0229	0.149	0.710	29.610	221.767
2003	-0.331	-3.776	0.268	0.352	28.760	207.724

## Alkalinity

Figure 125 presents the seasonal mean alkalinity trend in Limekiln Lake, while Table 98 presents descriptive statistics for alkalinity in Limekiln Lake. The alkalinity in Limekiln Lake was low and generally stable throughout the period of record. The alkalinity in Limekiln Lake was significantly lower than the county average.

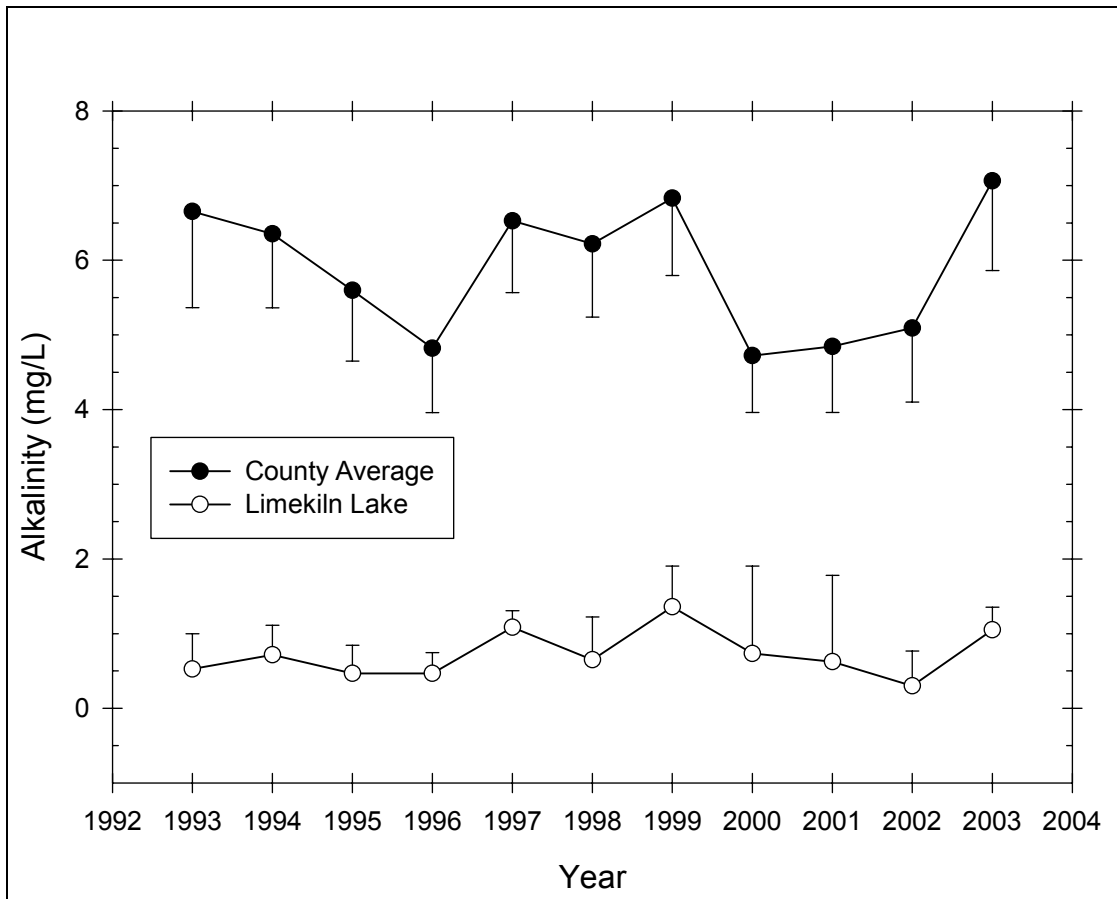


Figure 125 Seasonal mean alkalinity trend in Limekiln Lake

**Table 98 – Descriptive Statistics for Alkalinity in Limekiln Lake**

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	0.525	0.299	0.149	0.475
1994	6	0	0.717	0.376	0.154	0.395
1995	6	0	0.467	0.361	0.148	0.379
1996	6	0	0.467	0.266	0.109	0.279
1997	6	0	1.083	0.214	0.0872	0.224
1998	6	0	0.650	0.547	0.223	0.574
1999	6	1	1.360	0.439	0.196	0.545
2000	6	0	0.733	1.117	0.456	1.172
2001	6	2	0.625	0.727	0.364	1.158
2002	6	2	0.300	0.294	0.147	0.468
2003	6	2	1.050	0.191	0.0957	0.305
Year	Range	Max	Min	Median	25%	75%
1993	0.700	0.900	0.200	0.500	0.300	0.750
1994	1.100	1.300	0.200	0.700	0.500	0.900
1995	0.900	1.000	0.1000	0.450	0.1000	0.700
1996	0.600	0.800	0.200	0.350	0.300	0.800
1997	0.500	1.300	0.800	1.100	0.900	1.300
1998	1.400	1.600	0.200	0.400	0.300	1.000
1999	1.100	1.700	0.600	1.500	1.200	1.625
2000	2.800	3.000	0.200	0.250	0.200	0.500
2001	1.600	1.700	0.1000	0.350	0.200	1.050
2002	0.600	0.600	0.000	0.300	0.0500	0.550
2003	0.400	1.200	0.800	1.100	0.900	1.200
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1993	0.423	-0.416	0.162	0.708	2.100	1.370
1994	0.313	0.398	0.146	0.757	4.300	3.790
1995	0.404	-1.285	0.178	0.654	2.800	1.960
1996	0.728	-1.861	0.266	0.202	2.800	1.660
1997	-0.232	-2.150	0.207	0.500	6.500	7.270
1998	1.321	0.805	0.275	0.168	3.900	4.030
1999	-1.882	3.768	0.336	0.067	6.800	10.020
2000	2.392	5.766	0.416	0.002	4.400	9.460
2001	1.822	3.465	0.371	0.056	2.500	3.150
2002	-1.073E-015	-4.891	0.252	0.425	1.200	0.620
2003	-0.855	-1.289	0.283	0.289	4.200	4.520

## Total Phosphorus

Figure 126 presents the seasonal mean total phosphorus trend in Limekiln Lake, while Table 99 presents descriptive statistics for total phosphorus in Limekiln Lake. The total phosphorus in Limekiln Lake exhibited a decreasing trend from 1995 to 2003. The total phosphorus in Limekiln Lake was generally slightly lower than the county average, though this difference was not statistically significant.

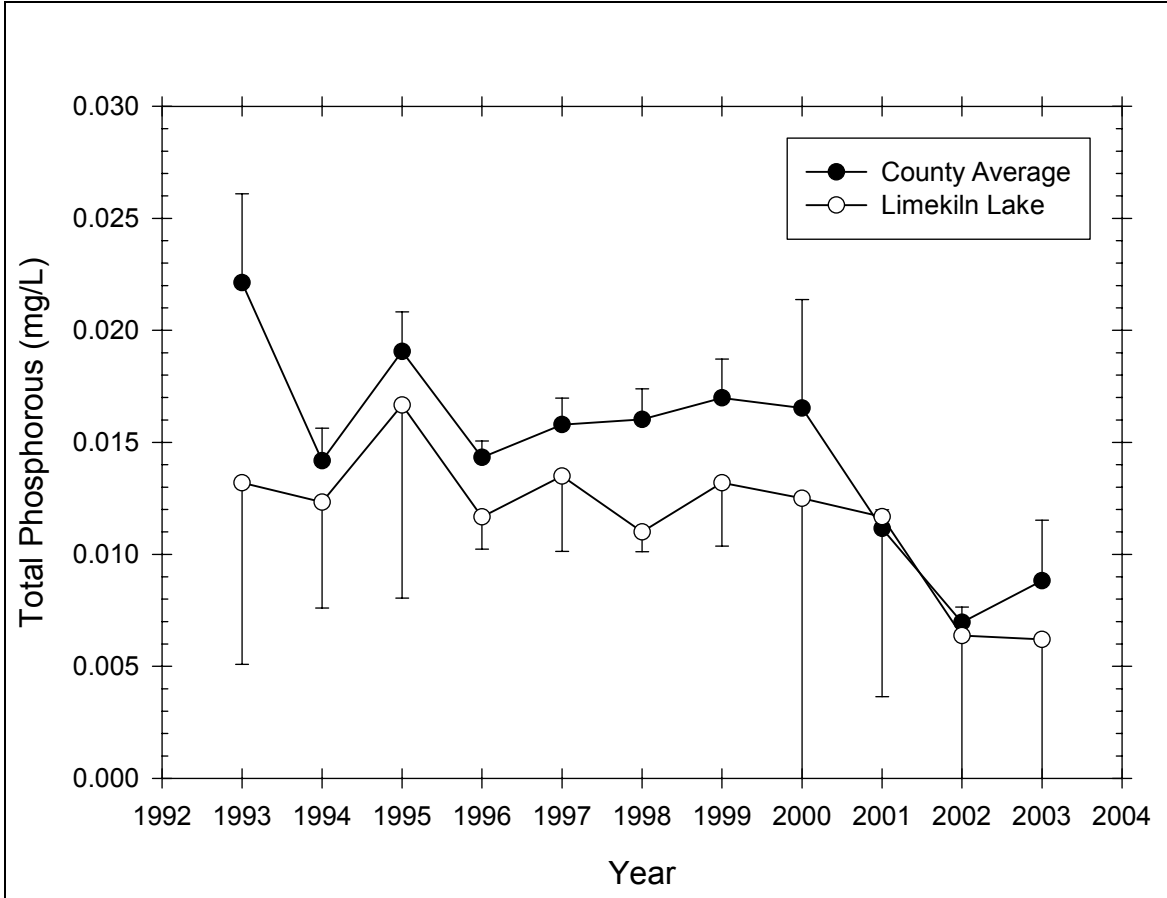


Figure 126 Seasonal mean total phosphorus trend in Limekiln Lake

Table 99 – Descriptive Statistics for Total Phosphorus in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0132	0.00653	0.00292	0.00811
1994	6	0	0.0123	0.00450	0.00184	0.00472
1995	6	0	0.0167	0.00821	0.00335	0.00862
1996	6	0	0.0117	0.00137	0.000558	0.00143
1997	6	0	0.0135	0.00321	0.00131	0.00337
1998	6	1	0.0110	0.000707	0.000316	0.000878
1999	6	1	0.0132	0.00228	0.00102	0.00283
2000	6	1	0.0125	0.0119	0.00532	0.0148
2001	6	2	0.0117	0.00505	0.00252	0.00803
2002	6	2	0.00637	0.00428	0.00214	0.00682
2003	6	2	0.00620	0.00390	0.00195	0.00621
Year	Range	Max	Min	Median	25%	75%
1993	0.0160	0.0180	0.00200	0.0160	0.0103	0.0173
1994	0.0130	0.0210	0.00800	0.0115	0.01000	0.0120
1995	0.0230	0.0300	0.00700	0.0160	0.01000	0.0210
1996	0.00300	0.0130	0.01000	0.0120	0.01000	0.0130
1997	0.00900	0.0180	0.00900	0.0140	0.0110	0.0150
1998	0.00200	0.0120	0.01000	0.0110	0.0108	0.0113
1999	0.00600	0.0170	0.0110	0.0130	0.0118	0.0140
2000	0.0315	0.0325	0.001000	0.0110	0.00550	0.0164

2001	0.0110	0.0190	0.00800	0.00985	0.00835	0.0150
2002	0.00950	0.0127	0.00320	0.00480	0.00400	0.00875
2003	0.00900	0.00980	0.000800	0.00710	0.00345	0.00895
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1993	-1.818	3.337	0.288	0.189	0.0660	0.00104
1994	1.823	4.022	0.363	0.013	0.0740	0.00101
1995	0.675	0.312	0.150	0.749	0.1000	0.00200
1996	-0.523	-1.875	0.263	0.213	0.0700	0.000826
1997	-0.0817	-0.514	0.180	0.646	0.0810	0.00114
1998	6.106E-015	2.000	0.300	0.149	0.0550	0.000607
1999	1.493	2.818	0.335	0.069	0.0660	0.000892
2000	1.557	3.099	0.350	0.044	0.0625	0.00135
2001	1.641	2.609	0.303	0.215	0.0467	0.000622
2002	1.808	3.473	0.393	0.030	0.0255	0.000218
2003	-1.164	1.288	0.240	0.477	0.0248	0.000199

## Nitrate

Figure 127 presents the seasonal mean nitrate trend in Limekiln Lake, while Table 100 presents descriptive statistics for nitrate in Limekiln Lake. The nitrate in Limekiln Lake exhibited a general decreasing trend from 1997 to 2002. The nitrate in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

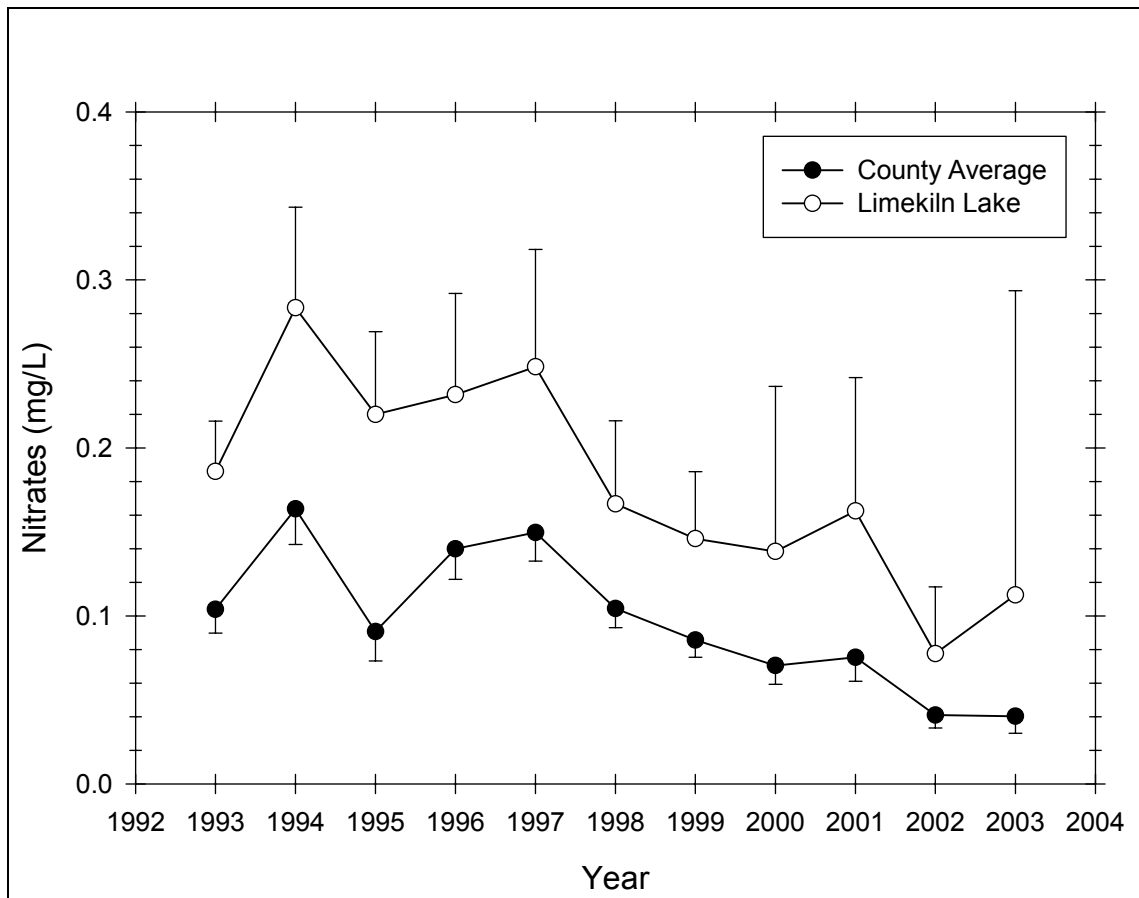


Figure 127 Seasonal mean nitrate trend in Limekiln Lake

**Table 100 – Descriptive Statistics for Nitrate in Limekiln Lake**

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.186	0.0241	0.0108	0.0299
1994	6	0	0.283	0.0572	0.0233	0.0600
1995	6	0	0.220	0.0469	0.0191	0.0492
1996	6	0	0.232	0.0574	0.0234	0.0603
1997	6	0	0.248	0.0665	0.0271	0.0697
1998	6	0	0.167	0.0472	0.0193	0.0495
1999	6	1	0.146	0.0321	0.0144	0.0398
2000	6	0	0.138	0.0937	0.0382	0.0983
2001	6	2	0.163	0.0499	0.0250	0.0794
2002	6	2	0.0775	0.0250	0.0125	0.0398
2003	6	2	0.113	0.114	0.0569	0.181
Year	Range	Max	Min	Median	25%	75%
1993	0.0600	0.220	0.160	0.180	0.168	0.205
1994	0.150	0.360	0.210	0.290	0.230	0.320
1995	0.110	0.280	0.170	0.220	0.170	0.260
1996	0.140	0.320	0.180	0.215	0.180	0.280
1997	0.170	0.340	0.170	0.250	0.180	0.300
1998	0.110	0.220	0.110	0.165	0.120	0.220
1999	0.0800	0.190	0.110	0.150	0.117	0.167
2000	0.280	0.300	0.0200	0.125	0.0900	0.170
2001	0.110	0.230	0.120	0.150	0.125	0.200
2002	0.0600	0.110	0.0500	0.0750	0.0600	0.0950
2003	0.220	0.230	0.01000	0.105	0.0150	0.210
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1993	0.601	-0.945	0.198	0.604	0.930	0.175
1994	-0.0475	-1.402	0.180	0.647	1.700	0.498
1995	0.0872	-2.151	0.190	0.595	1.320	0.301
1996	0.784	-0.994	0.209	0.489	1.390	0.339
1997	0.112	-1.326	0.181	0.638	1.490	0.392
1998	0.0558	-1.840	0.204	0.519	1.000	0.178
1999	0.299	-1.021	0.191	0.636	0.730	0.111
2000	0.905	1.799	0.202	0.530	0.830	0.159
2001	1.055	-0.00174	0.243	0.465	0.650	0.113
2002	0.560	0.928	0.210	0.598	0.310	0.0259
2003	0.0991	-5.356	0.292	0.256	0.450	0.0895

## Chlorophyll a

Figure 128 presents the seasonal mean chlorophyll *a* trend in Limekiln Lake, while Table 101 presents descriptive statistics for chlorophyll *a* in Limekiln Lake. The chlorophyll *a* in Limekiln Lake exhibited an increasing trend from 1997 to 2001. The chlorophyll *a* in Limekiln Lake was lower than the county average, though this difference may not be statistically significant for all years.

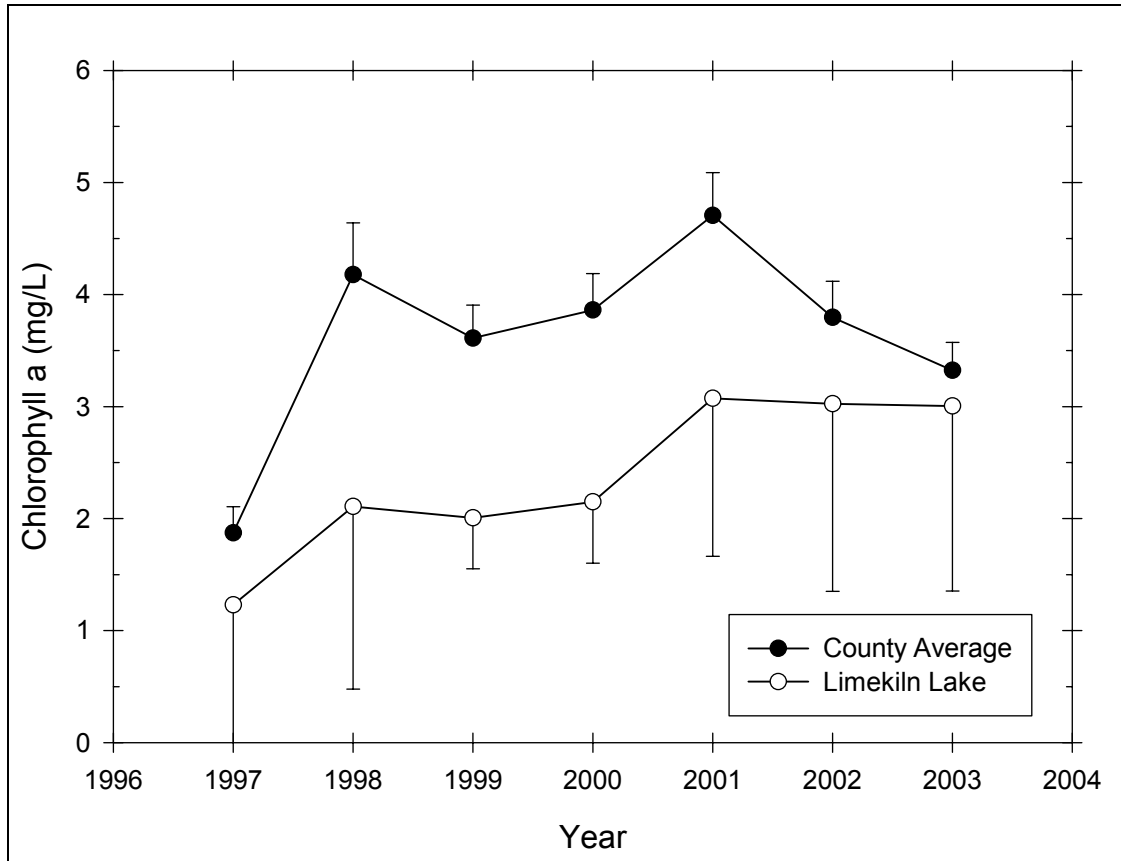


Figure 128 Seasonal mean chlorophyll a trend in Limekiln Lake

Table 101 – Descriptive Statistics for Chlorophyll a in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.230	1.605	0.655	1.684
1998	6	0	2.108	1.554	0.634	1.631
1999	6	1	2.006	0.366	0.164	0.454
2000	6	0	2.148	0.521	0.212	0.546
2001	6	2	3.072	0.886	0.443	1.409
2002	6	2	3.025	1.053	0.527	1.676
2003	6	2	3.005	1.038	0.519	1.652
Year	Range	Max	Min	Median	25%	75%
1997	4.070	4.460	0.390	0.490	0.440	1.110
1998	3.940	4.570	0.630	1.490	1.070	3.400
1999	0.970	2.450	1.480	2.060	1.758	2.255
2000	1.590	3.080	1.490	2.125	1.920	2.150
2001	2.130	4.220	2.090	2.990	2.455	3.690
2002	2.280	4.570	2.290	2.620	2.360	3.690
2003	2.480	4.440	1.960	2.810	2.355	3.655
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1997	2.309	5.403	0.363	0.013	7.380	21.950
1998	0.932	-0.668	0.244	0.301	12.650	38.747
1999	-0.472	0.189	0.159	0.731	10.030	20.655
2000	1.088	2.752	0.332	0.037	12.890	29.047

2001	0.525	0.960	0.211	0.597	12.290	40.115
2002	1.752	3.074	0.331	0.132	12.100	39.930
2003	1.069	2.092	0.302	0.220	12.020	39.355

## Transparency

Figure 129 presents the seasonal mean transparency trend in Limekiln Lake, while Table 102 presents descriptive statistics for transparency in Limekiln Lake. The transparency in Limekiln Lake was quite variable, but exhibited a slight decreasing trend from 1995 to 2002. The transparency in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

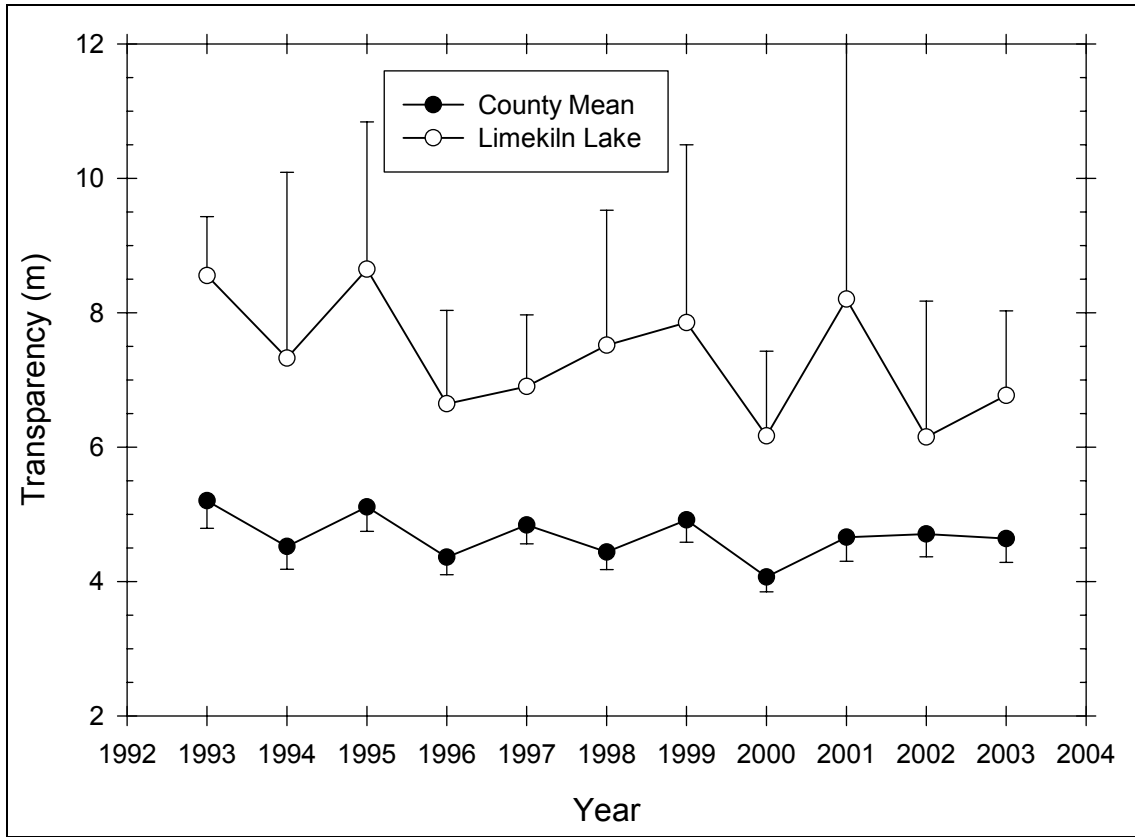


Figure 129 Seasonal mean transparency trend in Limekiln Lake

Table 102 – Descriptive Statistics for Transparency in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	8.552	0.708	0.317	0.879
1994	6	0	7.325	2.635	1.076	2.766
1995	6	0	8.647	2.088	0.853	2.192
1996	6	0	6.645	1.325	0.541	1.391
1997	6	0	6.900	1.017	0.415	1.068
1998	6	0	7.517	1.914	0.781	2.009
1999	5	0	7.852	2.132	0.954	2.648
2000	6	0	6.168	1.199	0.489	1.258
2001	3	0	8.200	1.664	0.961	4.134

2002	4	0	6.150	1.271	0.636	2.023
2003	4	0	6.770	0.790	0.395	1.258
<b>Year</b>	<b>Range</b>	<b>Max</b>	<b>Min</b>	<b>Median</b>	<b>25%</b>	<b>75%</b>
1993	1.660	9.240	7.580	8.790	7.940	9.127
1994	6.750	10.950	4.200	7.400	4.600	9.400
1995	5.700	12.100	6.400	7.890	7.500	10.100
1996	3.300	8.050	4.750	6.940	5.390	7.800
1997	2.710	7.560	4.850	7.185	7.170	7.450
1998	5.010	9.710	4.700	7.575	6.440	9.100
1999	5.550	10.750	5.200	8.400	6.115	9.055
2000	3.140	8.500	5.360	5.625	5.500	6.400
2001	3.100	10.100	7.000	7.500	7.125	9.450
2002	2.700	7.200	4.500	6.450	5.150	7.150
2003	1.780	7.850	6.070	6.580	6.190	7.350
<b>Year</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>K-S Dist.</b>	<b>K-S Prob.</b>	<b>Sum</b>	<b>Sum of Squares</b>
1993	-0.636	-1.728	0.232	0.442	42.760	367.690
1994	0.0956	-1.292	0.183	0.632	43.950	356.662
1995	0.987	0.209	0.242	0.310	51.880	470.393
1996	-0.554	-1.453	0.177	0.658	39.870	273.720
1997	-2.305	5.480	0.438	<0.001	41.400	290.836
1998	-0.374	-1.267	0.205	0.512	45.100	357.320
1999	0.136	-0.477	0.201	0.591	39.260	326.459
2000	2.011	4.051	0.334	0.035	37.010	235.472
2001	1.558	--	0.330	0.218	24.600	207.260
2002	-0.817	-1.439	0.273	0.333	24.600	156.140
2003	1.107	0.550	0.220	0.562	27.080	185.206

## TSI

Figure 130 presents the Carlson trophic state index trend in Limekiln Lake. Transparency TSI was in the oligotrophic range throughout the period of record, while chlorophyll *a* TSI was within the mesotrophic range from 1997 to 2000 and at the mesotrophic-eutrophic boundary from 2001 to 2003. Total phosphorus TSI was generally mesotrophic or at the oligotrophic-mesotrophic boundary, although the values were into the oligotrophic range in 2002 and 2003.

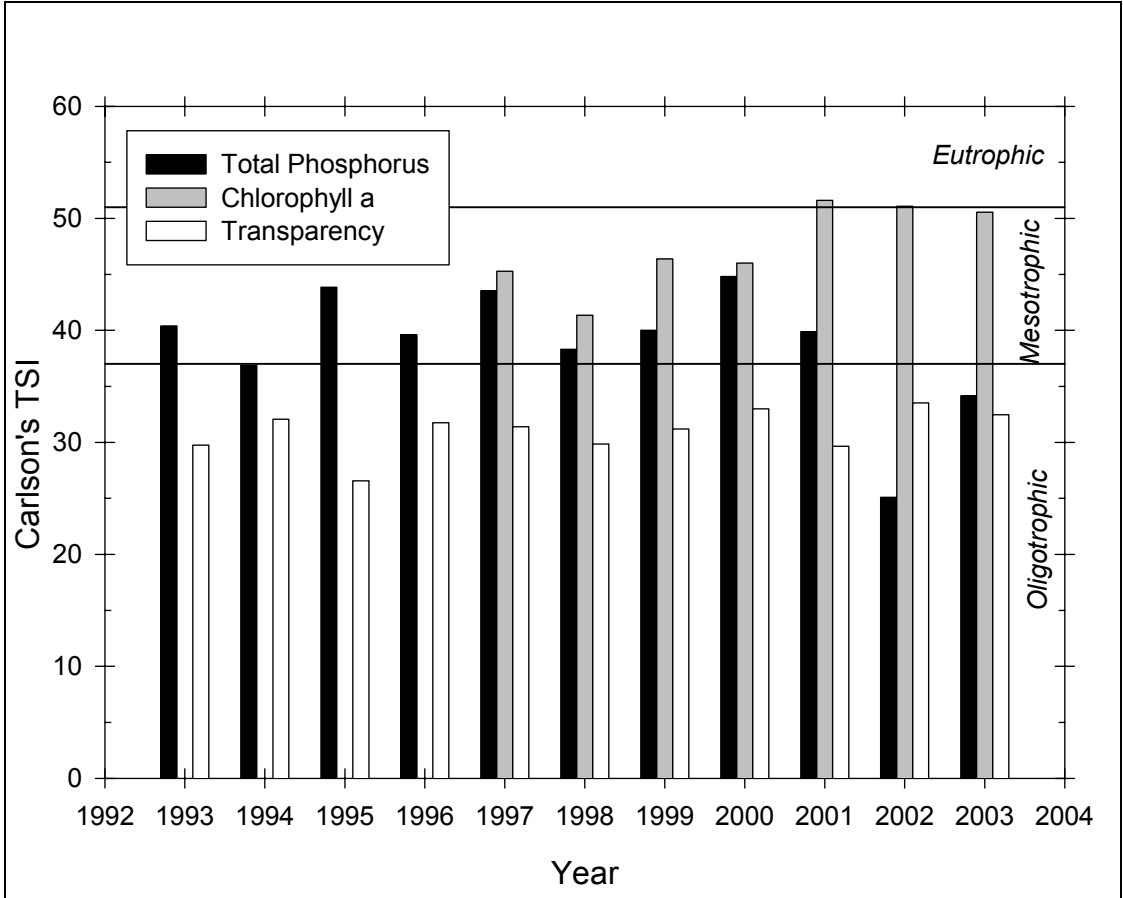


Figure 130 Carlson TSI trend in Limekiln Lake

### Aluminum

Figure 131 presents the seasonal mean aluminum trend in Limekiln Lake, while Table 103 presents descriptive statistics for aluminum in Limekiln Lake. The aluminum in Limekiln Lake was quite variable, exhibiting no specific trend. The aluminum in Limekiln Lake was slightly higher than the county average, though this difference was generally not statistically significant.

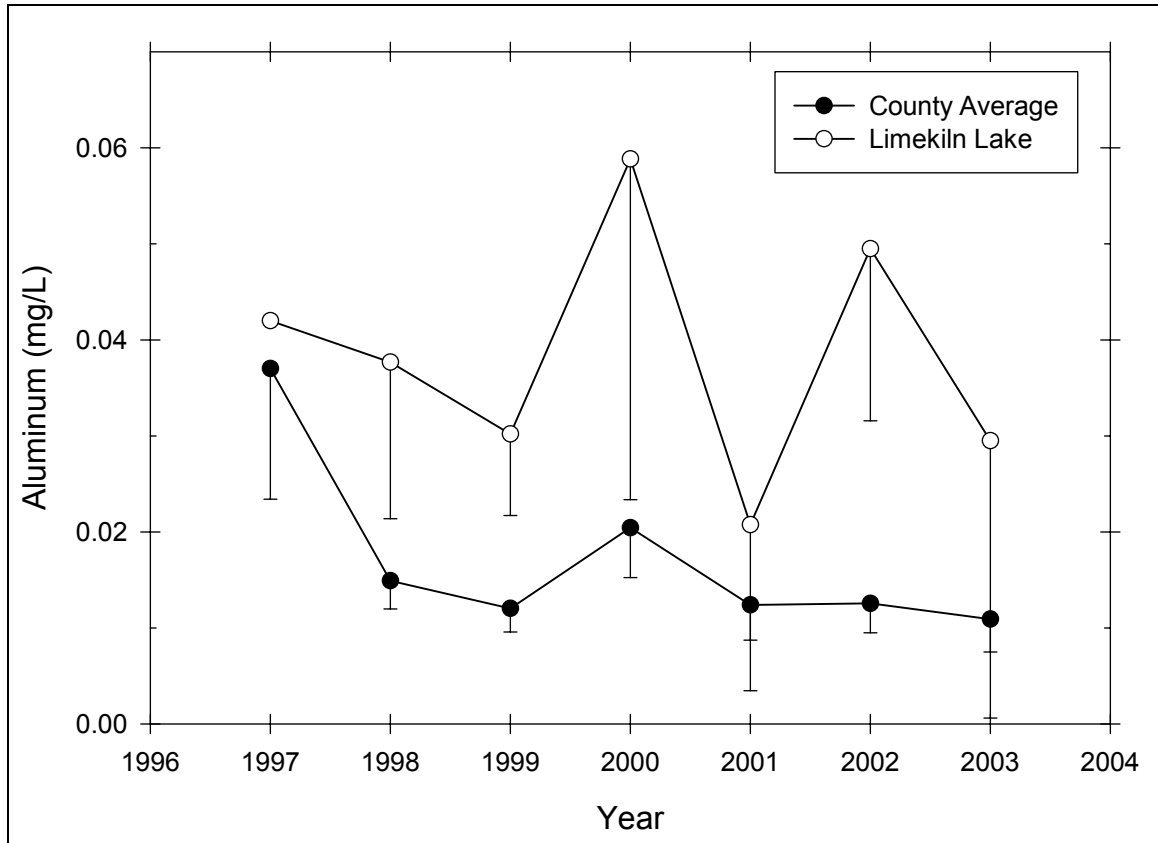


Figure 131 Seasonal mean aluminum trend in Limekiln Lake

Table 103 – Descriptive Statistics for Aluminum in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0420	--	--	--
1998	6	0	0.0377	0.0155	0.00634	0.0163
1999	6	1	0.0302	0.00683	0.00306	0.00849
2000	6	0	0.0588	0.0338	0.0138	0.0355
2001	6	2	0.0208	0.0109	0.00544	0.0173
2002	6	2	0.0495	0.0113	0.00563	0.0179
2003	6	2	0.0295	0.0182	0.00908	0.0289
Year	Range	Max	Min	Median	25%	75%
1997	0.000	0.0420	0.0420	0.0420	0.0420	0.0420
1998	0.0460	0.0580	0.0120	0.0385	0.0320	0.0470
1999	0.0170	0.0420	0.0250	0.0290	0.0258	0.0323
2000	0.0900	0.118	0.0280	0.0520	0.0290	0.0740
2001	0.0230	0.0280	0.00500	0.0250	0.0135	0.0280
2002	0.0250	0.0580	0.0330	0.0535	0.0425	0.0565
2003	0.0430	0.0550	0.0120	0.0255	0.0185	0.0405
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1997	--	--	--	--	0.0420	0.00176
1998	-0.628	1.142	0.191	0.591	0.226	0.00972
1999	1.860	3.712	0.370	0.024	0.151	0.00475
2000	1.189	1.264	0.188	0.604	0.353	0.0265
2001	-1.629	2.487	0.296	0.241	0.0830	0.00208

2002	-1.722	3.094	0.338	0.116	0.198	0.0102
2003	1.235	2.362	0.326	0.144	0.118	0.00447

## Calcium

Figure 132 presents the seasonal mean calcium trend in Limekiln Lake, while Table 104 presents descriptive statistics for calcium in Limekiln Lake. The calcium in Limekiln Lake was generally stable throughout the period of record. The calcium in Limekiln Lake was significantly lower than the county average.

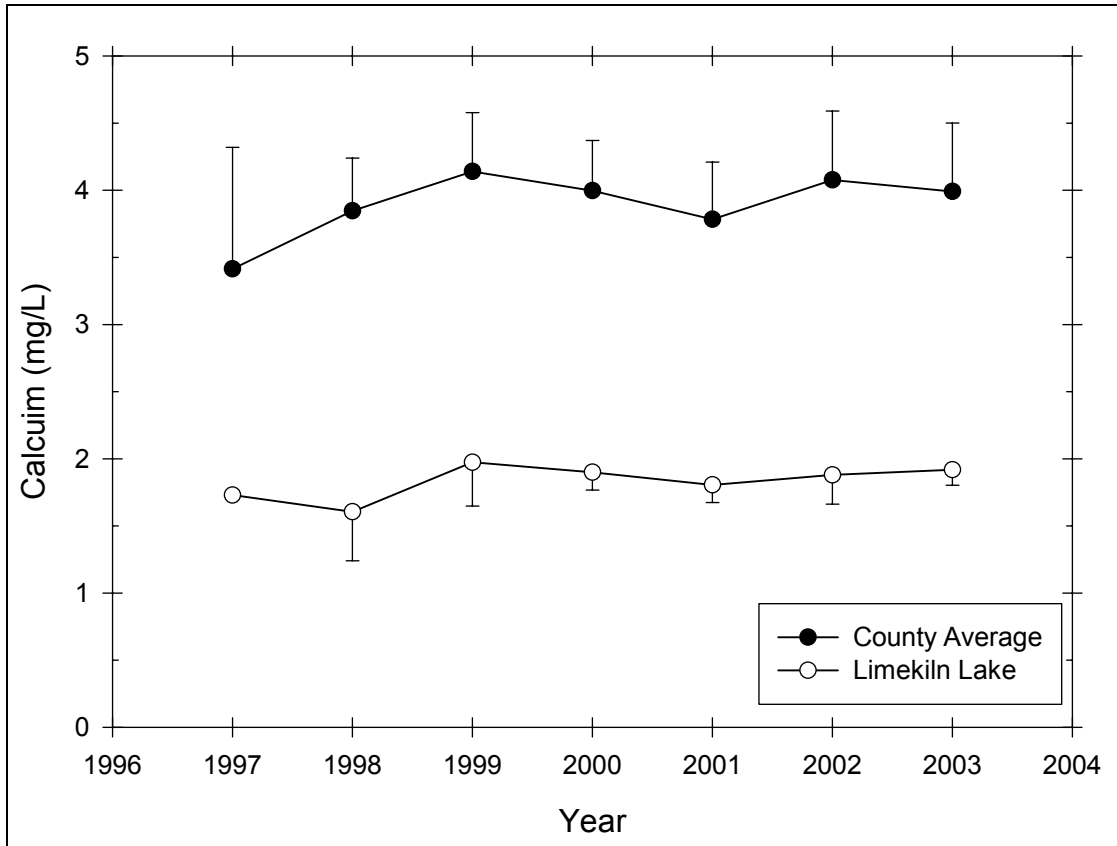


Figure 132 Seasonal mean calcium trend in Limekiln Lake

Table 104 – Descriptive Statistics for Calcium in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.730	--	--	--
1998	6	0	1.605	0.348	0.142	0.366
1999	6	1	1.974	0.263	0.117	0.326
2000	6	0	1.900	0.127	0.0519	0.133
2001	6	2	1.805	0.0823	0.0411	0.131
2002	6	2	1.880	0.137	0.0687	0.219
2003	6	2	1.918	0.0727	0.0364	0.116
Year	Range	Max	Min	Median	25%	75%
1997	0.000	1.730	1.730	1.730	1.730	1.730
1998	0.920	1.880	0.960	1.730	1.470	1.860
1999	0.670	2.320	1.650	2.010	1.755	2.155

2000	0.370	2.080	1.710	1.885	1.850	1.990
2001	0.200	1.910	1.710	1.800	1.750	1.860
2002	0.310	1.990	1.680	1.925	1.795	1.965
2003	0.160	2.010	1.850	1.905	1.860	1.975
Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1997	--	--	--	--	1.730	2.993
1998	-1.626	2.487	0.285	0.134	9.630	16.063
1999	0.0743	-0.962	0.158	0.732	9.870	19.759
2000	-0.0710	0.257	0.180	0.643	11.400	21.741
2001	0.356	1.282	0.226	0.537	7.220	13.052
2002	-1.653	2.983	0.336	0.119	7.520	14.194
2003	0.672	-1.677	0.243	0.463	7.670	14.723

### Calcite Saturation Index

Figure 133 presents the calcite saturation index trend in Limekiln Lake. The CSI in Limekiln Lake exhibited a variable but generally decreasing trend from 1997 to 2003. The CSI in Limekiln Lake exhibited a variable but generally decreasing trend from 1997 to 2003. The CSI was well into the very vulnerable to acid deposition range in 1997 and 1998, but moved into the moderately vulnerable range in 1999 and 2000, then fluctuated around the boundary between moderately and very vulnerable. The CSI in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

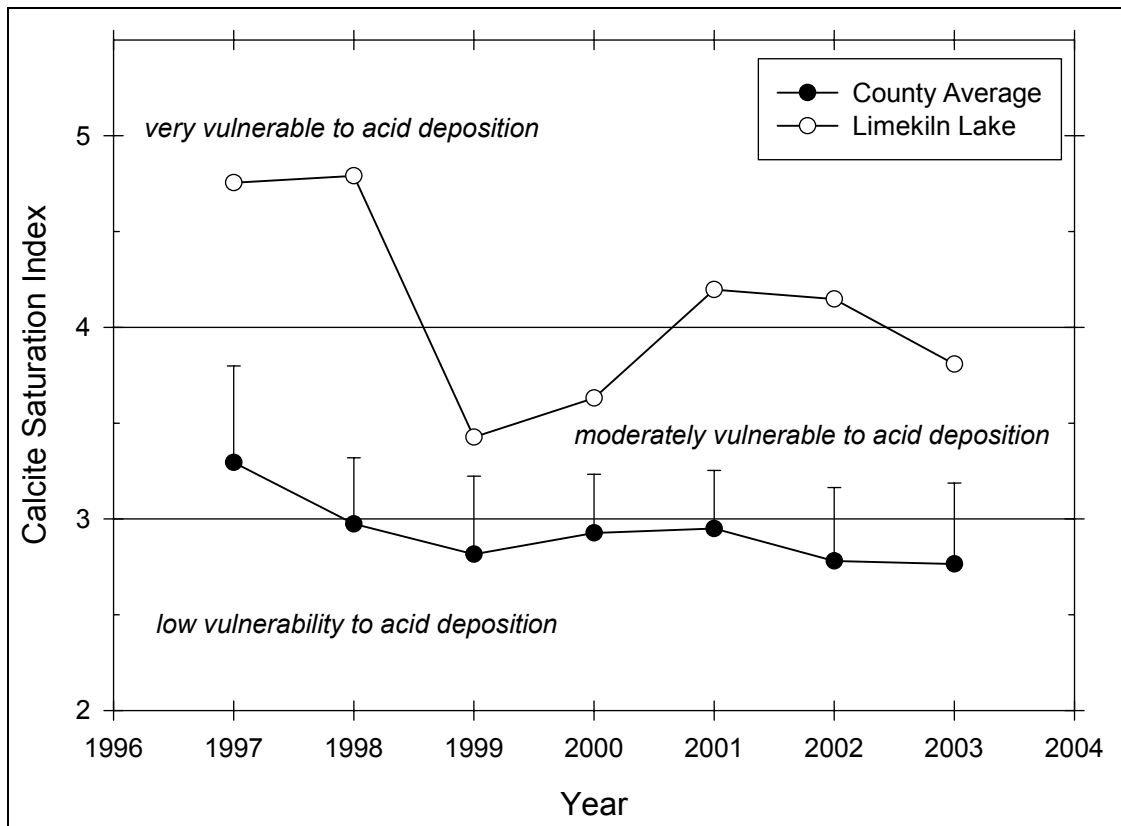


Figure 133 Seasonal mean CSI trend in Limekiln Lake