

Task B.3.4 Stream Water Quality

B.3.4 Stream water quality (using data sets 3.2, 3.4, and 3.7)

- DEQ WQ Statistics (Field and Analyte)
- DEQ SW Quality Table Relates (memo)
- DEQ SW Quality Station Mapping (memo)
- DEQ SW Quality Data Maintenance (memo)
- DEQ SW Quality Maps (example of analyst data counts)
- Relating USGS NAWQA Data (memo)
- NAWQA Station Map (example graphic)
- Creating Time-Averages Values [stream assessments] (memo)
- Stream Assessment - Categorized (example map)

Data Set 3.2

VA DEQ Water Quality (Trend and Ambient Stream Monitoring)

The Dept of Environmental Quality (DEQ) operates numerous stream monitoring sites, often coincident with USGS streamflow gages. Water chemistry data includes basic cations and anions as well as pH, temperature, fecal/E.Coli. Trend stations are long-term sites and ambient stations are used on a rotating basis. Data are obtained from DEQ web site. There a total of 57 monitoring sites in Loudoun County. Only nine of these are designated at “trend” sites. There are 82,000 water measurements on file.

Data Set 3.4

Broad Run Water Quality Monitoring Program (OWML)

Since 1990, a station on Broad Run, upstream of the LCSA plant now under construction has been monitored for water chemistry and flow. Only an approximate site location is known. Over 430 sampling events have been recorded every two weeks with approximately 20 to 50 analyses per sample. In general the recent stream flow data were found to be consistent with the new USGS station on Broad Run. Review of the fecal concentration display the expected positive correlation with increased streamflow. Comparisons with DEQ data have not been examined. Data are available in raw Excel format only.

Data Set 3.7

Loudoun Soil & Water Conservation District Stream Monitoring

Since 1999, the LSWCD has monitored 14 stations in the Piney Run, Catoctin Creek, Little River, North Fork Goose Creek, and Beaver Dam watersheds for fecal coliform. This effort is related to the potential development of fecal coliform Total Maximum Daily Loads (TMDL) for these waterways, and was expanded to include E-Coli in 2003. Some water chemistry and macroinvertebrate data are also available. Data are periodically posted to the LSWCD web site (<http://loudoun.vaswcd.org/>) and the most recent data can be obtained by contacting the LSWCD office.

Task B.3.4 Analysis of Surface Water Quality Data.

The only data set used here is from DEQ, due to higher level of quality control, better spatial distribution and longer temporal records.

Section A) Surface Water Quality Field data. Includes parameters pH, Dissolved Oxygen by probe, Dissolved Oxygen by Winkler method, Temperature, and Specific Conductance.

- 1) Summary statistic table for field parameters for all DEQ field data.
- 2) Summary statistics table for specific conductance measurements at each DEQ sample site with data collected. (87 sites)
- 3) Summary statistics table for temperature measurements at each DEQ sample site with data collected. (122 sites)
- 4) Summary statistics table DO (probe) measurements at each DEQ sample site with data collected. (86 sites)
- 5) Summary statistics table for DO (Winkler) measurements at each DEQ sample site with data collected. (93 sites)
- 6) Summary statistics table pH measurements at each DEQ sample site with data collected. (133 sites)

Section B) Monthly averages for several field and lab analytes including Total Suspended Solids, DO (probe), Total Phosphorous, Total Nitrogen, Turbidity, and Temperature.

Section C) Surface Water Quality lab analyses. Summary statistics for 72 analytes sampled by DEQ at 142 sites in Loudoun County or contributing watersheds.

Section D) Twenty sites in Loudoun County and contributing watersheds were chosen for more detailed analysis based on the length of sampling record found at those sites. This section show statistics for those 20 sites by a subset of 13 major analytes.

- 1) Summary Statistics table for conductivity at DEQ long records sites.
- 2) Summary Statistics table for TOC at DEQ long records sites.
- 3) Summary Statistics table for Alkalinity at DEQ long records sites.
- 4) Summary Statistics table for pH at DEQ long records sites.
- 5) Summary Statistics table for Turbidity at DEQ long records sites.
- 6) Summary Statistics table for Total P at DEQ long records sites.
- 7) Summary Statistics table for Nitrate at DEQ long records sites.
- 8) Summary Statistics table for Ammonia at DEQ long records sites.
- 9) Summary Statistics table for Chloride at DEQ long records sites.
- 10) Summary Statistics table for Sulfate at DEQ long records sites.
- 11) Summary Statistics table for Fluoride at DEQ long records sites.
- 12) Summary Statistics table for 5 day BOD at DEQ long records sites.
- 13) Summary Statistics table for COD at DEQ long records sites.

Section E) Statistical and graphical analysis of individual analytes for all sites with long records.

- 1) One variable analysis – Nitrogen
- 2) One variable analysis – Ammonia
- 3) One variable analysis – Nitrite
- 4) One variable analysis – Nitrate
- 5) One variable analysis – Total Phosphorous
- 6) One variable analysis – Orthophosphate
- 7) One variable analysis – Chloride
- 8) One variable analysis – Sulfate
- 9) One variable analysis – Fluoride
- 10) One variable analysis – Arsenic
- 11) One variable analysis – Lead
- 12) One variable analysis – Zinc
- 13) One variable analysis – Manganese
- 14) One variable analysis – Specific Conductance
- 15) One variable analysis – Turbidity
- 16) One variable analysis – 5 day BOD
- 17) One variable analysis – COD
- 18) One variable analysis – pH
- 19) One variable analysis – TOC

Section A) Surface Water Quality Field data.
Includes parameters pH, Dissolved Oxygen by probe, Dissolved Oxygen by Winkler method, Temperature, and Specific Conductance.

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Analytes for all Sites	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
pH (std. units)	8257	7.44	7.40	0.519	6.98%	0.07	10.7	10.63	7.14	7.7	0.56	5.33762	146.055
DO Probe (mg/L)	5759	10.07	10.00	2.645	26.27%	3.13	18.1	14.97	7.98	12	4.02	6.70847	-9.63094
DO Winkler (mg/L)	2835	10.18	10.10	2.641	25.94%	0	73.5	73.5	8.4	12	3.6	102.586	1258.69
Temp oC	8576	13.55	13.90	7.741	57.14%	-0.08	32	32.08	7	20.4	13.4	-2.60734	-22.737
Spec. Cond. (uS/cm)	6828	227.49	180.20	274.035	120.46%	0	19100	19100	140.4	266	125.6	1647.64	55731.7

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Specific Conductance (uS/cm)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABEC004.76	223	182.354	166.3	48.8991	26.82%	63.1	281	217.9	150.9	224.4	73.5	2.87995	-1.37371
1ABEC011.19	66	230.833	183.1	106.362	46.08%	114	457.8	343.8	147.4	311.3	163.9	2.84177	-0.773317
1ABEE000.40	2	121.5	121.5	0.707107	0.58%	121	122	1	121	122	1		
1ABEE001.40	1	122	122		%	122	122	0	122	122	0		
1ABEM000.60	19	397.868	415	68.4829	17.21%	301	499	198	332	427	95	0.125027	-0.96293
1ABOL002.56	60	207.742	183.2	67.0432	32.27%	128.7	312.5	183.8	150.5	295.4	144.9	1.80697	-2.14659
1ABRB002.15	369	299.356	289	135.378	45.22%	54.9	1720	1665.1	228	352.7	124.7	26.8616	126.721
1ABRB006.33	28	350.925	395.8	126.529	36.06%	133.8	542	408.2	226	455	229	-0.58129	-1.09447
1ABRB015.04	6	328.8	328.8	116.555	35.45%	222.4	435.2	212.8	222.4	435.2	212.8	-6.18E-16	-1.66667
1ABRB015.38	0				%								
1ABUL016.31	24	232.5	230.35	48.7745	20.98%	151.2	327.8	176.6	206.5	253.65	47.15	0.778824	0.390393
1ABUL025.94	174	171.025	159.1	55.5791	32.50%	16.3	371.4	355.1	133.2	194.7	61.5	5.64954	5.31938
1ACAA000.83	6	133	133	0	0.00%	133	133	0	133	133	0		
1ACAA003.46	27	178.633	172.5	48.4746	27.14%	111	255	144	137	207.3	70.3	0.518711	-1.19604
1ACAX004.57	415	167.55	158.6	90.4155	53.96%	72.4	1660	1587.6	144	177	33	107.021	818.396
1ACLK002.40	33	294.836	270.5	49.6176	16.83%	234.8	404.9	170.1	266	326	60	2.40932	0.213713
1ACRA000.42	36	179.794	181.5	64.9087	36.10%	95.2	273.6	178.4	110.5	219	108.5	-0.138071	-1.73258
1ACRF001.18	24	211.287	213.3	19.7949	9.37%	176.3	248	71.7	200.3	219.4	19.1	0.156698	0.288701
1ACRM001.20	155	142.386	125.2	46.5131	32.67%	71	256.3	185.3	111.8	167.3	55.5	6.01065	1.57035
1ACRM009.86	6	112.8	112.8	0	0.00%	112.8	112.8	0	112.8	112.8	0		
1ACUB002.61	123	468.92	418.7	258.108	55.04%	160.4	1309	1148.6	301	537.5	236.5	8.50736	8.33284
1ACUB003.74	94	326.763	324	150.205	45.97%	80.2	757	676.8	244	417	173	1.04195	0.901899
1ACUB008.60	52	569.683	539.1	164.12	28.81%	395.4	938	542.6	438.6	651.9	213.3	3.17915	0.789178
1ADUT000.62	20	160.995	144	43.9723	27.31%	106	237.4	131.4	129	193.1	64.1	1.0441	-0.791812
1ADUT002.72	2	138.5	138.5	0	0.00%	138.5	138.5	0	138.5	138.5	0		
1AELC001.39	67	516.699	416.5	235.145	45.51%	221.6	988.4	766.8	325.1	784.7	459.6	2.26666	-1.32793
1AFLL000.62	6	363.7	363.7	0	0.00%	363.7	363.7	0	363.7	363.7	0		
1AFOL000.53	1	384	384		%	384	384	0	384	384	0		
1AFOL001.52	1	437	437		%	437	437	0	437	437	0		
1AGAR002.24	48	221.148	205.1	65.722	29.72%	122.3	313	190.7	152.9	281.85	128.95	-0.314083	-1.97959
1AGO0002.38	441	215.44	181.3	122.689	56.95%	67.3	1900	1832.7	144	255.5	111.5	55.6973	345.14
1AGO003.82	1	127	127		%	127	127	0	127	127	0		
1AGO004.89	1	164	164		%	164	164	0	164	164	0		
1AGO011.23	242	180.198	157.55	133.218	73.93%	7	1603	1596	135.4	194.8	59.4	56.0276	281.423
1AGO021.28	6	139	139	0	0.00%	139	139	0	139	139	0		
1AGO022.44	363	166.094	140.4	104.855	63.13%	8	1220	1212	127	171.8	44.8	45.9555	169.39
1AGO030.75	84	154.014	147.6	29.744	19.31%	98.1	237	138.9	138	171	33	3.26108	3.66911

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Specific Conductance (uS/cm)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1AGO0034.20	36	136.025	134.8	15.5085	11.40%	111.8	162.9	51.1	124.5	146.9	22.4	0.608507	-1.2651
1AGO0036.61	30	204.023	192	84.1627	41.25%	108.1	330.7	222.6	143.6	272	128.4	0.888993	-1.55274
1AGO0044.36	336	185.224	140.5	134.273	72.49%	49.6	832.4	782.8	119.1	196.5	77.4	23.9732	41.5471
1AGO0046.37	23	324.004	309.2	59.0893	18.24%	239.3	380.1	140.8	239.3	380.1	140.8	-0.897575	-1.43958
1AHOW003.68	12	180.925	169.85	58.7782	32.49%	114	270	156	140.85	221	80.15	0.920727	-0.526149
1AHPR003.87	200	342.273	317	161.246	47.11%	86.7	1366	1279.3	244	399.1	155.1	11.2517	23.0411
1ALII003.97	110	204.88	180.4	102.242	49.90%	82	632	550	136	241	105	7.6702	8.55318
1ALII006.75	27	364.933	389	101.34	27.77%	171.7	531.9	360.2	332	432.1	100.1	-0.805629	-0.145777
1ALIM001.16	155	224.717	228	62.4366	27.78%	60.2	342.1	281.9	178	270.4	92.4	-2.74858	-0.001282
1ALIM001.80	15	217.32	209	40.1316	18.47%	177	284.3	107.3	184	232.3	48.3	1.21418	-0.562544
1ALIV001.70	74	172.064	170.2	26.8762	15.62%	109	212.4	103.4	161.1	188.9	27.8	-2.57527	0.488445
1ALIV004.78	162	149.346	146	42.4348	28.41%	87	297.1	210.1	116	181.8	65.8	6.15877	6.12072
1ALIV006.92	29	116.948	119.9	7.83949	6.70%	103.7	128.4	24.7	109.8	122	12.2	-0.957519	-1.0909
1ALIV012.12	9	108	108	6.06218	5.61%	101	115	14	101	115	14	0	-1.04978
1AMIH001.98	29	141.934	142.9	10.6539	7.51%	123.6	153.3	29.7	136.9	151.6	14.7	-1.37379	-1.10442
1ANOB005.49	66	211.392	190.95	54.9864	26.01%	139.1	299.8	160.7	164	283	119	1.86125	-2.01932
1ANOC000.42	162	156.575	137.3	156.358	99.86%	0	1520	1520	122	162	40	43.211	185.785
1ANOC004.38	59	172.629	177.7	42.6647	24.71%	119.4	276	156.6	134.4	200.1	65.7	3.07121	0.967022
1ANOC007.28	15	154.56	144	32.6201	21.11%	124	209.9	85.9	128	166.9	38.9	1.38428	-0.497397
1ANOC009.13	65	150.138	142.2	48.4318	32.26%	97	282.4	185.4	112	178.1	66.1	4.6056	3.27298
1ANOC009.37	29	122.014	116.5	15.2412	12.49%	98.7	144.9	46.2	111.7	140.4	28.7	0.338442	-1.34131
1ANOOG000.08	15	200.36	192	52.2536	26.08%	122	274.7	152.7	185	228.1	43.1	-0.145717	-0.571281
1ANOOG000.91	6	149	149	0	0.00%	149	149	0	149	149	0		
1ANOOG005.69	293	209.056	189	75.5235	36.13%	6	434.6	428.6	161.6	243	81.4	6.9142	4.40003
1ANOOG011.60	24	205.35	197.5	52.2445	25.44%	146.6	315	168.4	165.35	227.75	62.4	1.94556	0.297875
1APAE004.21	36	142.358	140.5	18.9057	13.28%	118.5	190.6	72.1	128.5	151.35	22.85	2.97557	1.87532
1APIA001.80	175	106.469	100.4	26.1964	24.60%	72.9	194.9	122	92	113.9	21.9	10.6087	11.341
1ASFS000.28	65	168.617	131.1	84.1724	49.92%	107.4	393.9	286.5	115.9	184.4	68.5	5.75234	3.22761
1ASOC000.01	2	164	164	0	0.00%	164	164	0	164	164	0		
1ASOC001.66	195	268.582	183	1356.13	504.92%	8	19100	19092	158.4	200.1	41.7	79.4961	554.787
1ASOC007.06	86	172.888	176.05	30.8827	17.86%	113.1	243.4	130.3	143.8	193	49.2	0.451619	0.066969
1ASOC010.09	7	176.429	177	0.9759	0.55%	175	177	2	175	177	2	-1.32816	-0.453652
1ASOC012.38	66	161.5	144.7	45.558	28.21%	105.4	254.3	148.9	131.5	205.2	73.7	1.76946	-1.40587
1ASOR002.99	24	204.475	191.45	59.5392	29.12%	141.6	293.4	151.8	153.35	255.6	102.25	1.06775	-1.26224
1ASUG004.42	290	318.008	282	212.056	66.68%	89	2480	2391	216.3	370.5	154.2	33.8752	138.636
1ASYC002.03	154	232.594	229.5	66.7726	28.71%	73.7	340.6	266.9	197	278	81	-1.65175	-0.633793
1ASYC004.93	60	187.817	174.2	64.0502	34.10%	101.4	369.9	268.5	157.2	188.75	31.55	5.67044	5.33139

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Specific Conductance (uS/cm)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ASYC007.43	70	190.803	167.1	69.8698	36.62%	100	366.7	266.7	151.8	202.4	50.6	4.93375	2.25526
1ATUS000.04	28	353.05	379	94.0247	26.63%	105.8	455.2	349.4	325.2	426.9	101.7	-2.93779	1.79955
1ATUS000.37	268	416.453	405.5	283.551	68.09%	2	4280	4278	301.35	506.5	205.15	63.4753	432.059
1AWAC003.31	6	318	318	0	0.00%	318	318	0	318	318	0		
1AXAQ000.85	24	267.625	264.5	38.2677	14.30%	194.2	321	126.8	250.45	297.95	47.5	-0.846573	-0.165945
1AXCO000.39	2	473	473	0	0.00%	473	473	0	473	473	0		
1AXCO000.92	2	344.4	344.4	0	0.00%	344.4	344.4	0	344.4	344.4	0		
1AXCO000.96	2	218.8	218.8	0	0.00%	218.8	218.8	0	218.8	218.8	0		
1AXDI000.01	2	240.3	240.3	0	0.00%	240.3	240.3	0	240.3	240.3	0		
1AXGJ000.42	15	204.34	206.6	27.9913	13.70%	171	240.1	69.1	177	227	50	-0.0021259	-1.41188
1AXJT002.22	29	150.559	150.8	11.9018	7.91%	124.9	166.5	41.6	145.1	162	16.9	-1.60148	0.270701
1AXKR000.77	6	162.2	162.2	3.11E-14	1.92E-16	162.2	162.2	0	162.2	162.2	0	-1.36931	-1.66667
1AXLE001.62	7	367.571	390	54.7383	14.89%	315	458	143	315	390	75	0.518509	-0.374554

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Temperature (°C)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABEC004.76	263	12.5066	13.5	6.951	55.58%	0	25	25	6.94	18.12	11.18	-0.519218	-4.02937
1ABEC011.19	61	12.0952	13.16	6.46032	53.41%	0.9	21.4	20.5	8.08	18.58	10.5	-0.424143	-1.65972
1ABEE000.40	2	22.45	22.45	0.777817	3.46%	21.9	23	1.1	21.9	23	1.1		
1ABEE001.40	2	22.15	22.15	0.919239	4.15%	21.5	22.8	1.3	21.5	22.8	1.3		
1ABEM000.60	22	15.7273	16.7	8.93656	56.82%	1	26.8	25.8	8.2	25	16.8	-0.516335	-1.11458
1ABIR000.76	43	13.5614	13	7.90551	58.29%	0	26	26	6.67	20.56	13.89	-0.572352	-1.60075
1ABIR005.21	1	19.7	19.7	%	19.7	19.7	0	19.7	19.7	0			
1ABLR000.10	1	7	7	%	7	7	0	7	7	0			
1ABOL002.56	60	14.7582	12.885	5.20902	35.30%	2.58	22.18	19.6	11.68	18.71	7.03	-0.919344	-0.693392
1ABRB002.15	450	14.0456	15.05	8.18174	58.25%	0.12	28.1	27.98	6.3	21.5	15.2	-1.22774	-5.71181
1ABRB006.33	31	13.2313	11.99	8.52893	64.46%	1.5	25.9	24.4	6.3	19.4	13.1	0.640943	-1.65919
1ABRB015.04	7	17.2514	22	7.22029	41.85%	9.55	23.37	13.82	9.55	23.37	13.82	-0.385734	-1.50061
1ABRB015.38	1	20.2	20.2	%	20.2	20.2	0	20.2	20.2	0			
1ABUL016.31	24	15.8663	18.45	8.25317	52.02%	4.4	25.8	21.4	7	22.915	15.915	-0.679142	-1.5478
1ABUL025.94	191	13.7541	13.2	7.59104	55.19%	0.04	28	27.96	8.1	19.77	11.67	-0.530602	-2.85642
1ACAA000.83	6	11.4	11.4	0	0.00%	11.4	11.4	0	11.4	11.4	0		
1ACAA003.46	27	15.1044	16	7.5396	49.92%	4.3	24.5	20.2	9.8	21.94	12.14	-0.451678	-1.62401
1ACAX000.19	53	12.9415	12.22	8.91028	68.85%	0.3	27.22	26.92	4.44	20	15.56	0.268668	-2.05913
1ACAX004.57	455	13.3318	13.2	7.91441	59.37%	0	27.5	27.5	6.9	19.91	13.01	-0.699882	-5.38826
1ACLK002.40	33	11.87	10.08	6.47318	54.53%	1.9	22.37	20.47	6.7	17.9	11.2	0.776559	-1.21853
1ACRA000.42	36	15.6011	14	3.55362	22.78%	11.32	20.98	9.66	12.21	18.42	6.21	0.562071	-1.82969
1ACRF001.18	27	14.9489	14.5	7.97938	53.38%	5.3	26.9	21.6	7.8	23.18	15.38	0.309703	-1.67326
1ACRM001.20	158	11.859	12.01	6.92669	58.41%	0.01	24.7	24.69	7.29	17.25	9.96	-0.702042	-2.5596
1ACRM005.39	1	25	25	%	25	25	0	25	25	0			
1ACRM008.59	1	25.5	25.5	%	25.5	25.5	0	25.5	25.5	0			
1ACRM009.86	8	14.575	14.5	0.138873	0.95%	14.5	14.8	0.3	14.5	14.65	0.15	1.66296	3.79E-14
1ACUB002.61	123	14.2935	12.9	7.54942	52.82%	1.31	26.89	25.58	7.29	20.99	13.7	-0.241463	-2.52191
1ACUB003.74	150	12.9341	12.89	7.6707	59.31%	0	26.1	26.1	6.76	17.9	11.14	-0.122836	-2.57507
1ACUB008.60	54	15.0319	15.73	6.52182	43.39%	6.06	23.06	17	7.68	20.73	13.05	-0.673538	-2.49233
1ADUT000.62	62	14.4587	15.56	8.66074	59.90%	0	26.8	26.8	7.22	22.3	15.08	-0.934173	-2.15647
1ADUT002.72	7	18.7714	21.7	6.7359	35.88%	8	24.9	16.9	10.8	24.9	14.1	-1.02702	-0.410559
1AECL001.39	67	14.6834	17.24	6.60834	45.01%	4.95	23.55	18.6	7.04	20.44	13.4	-0.877739	-2.61597
1AFLB000.64	23	14.3648	13.33	9.62899	67.03%	0.5	32	31.5	6.11	22.22	16.11	0.168384	-1.0922
1AFLB001.40	26	15.3954	15.75	8.9822	58.34%	1.3	31	29.7	6.2	23.89	17.69	0.0339072	-1.2018
1AFLB002.53	2	10.5	10.5	0.707107	6.73%	10	11	1	10	11	1		
1AFLL000.62	6	16.57	16.57	3.89E-15	2.35E-16	16.57	16.57	0	16.57	16.57	0	1.36931	-1.66667
1AFOL000.53	4	17.85	20.25	8.20508	45.97%	6.4	24.5	18.1	11.95	23.75	11.8	-1.05487	0.447543
1AFOL001.52	1	25.5	25.5	%	25.5	25.5	0	25.5	25.5	0			

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

Temperature (°C)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1AFRY000.60	1	9.3	9.3		%	9.3	9.3	0	9.3	9.3	0		
1AGAR002.24	48	13.3671	12.625	6.14735	45.99%	0.86	21.23	20.37	10.58	18	7.42	-1.92796	-0.150305
1AGO002.38	518	13.6419	13.41	8.31835	60.98%	0	28.33	28.33	6.39	21.4	15.01	0.170622	-6.10887
1AGO003.82	1	24.4	24.4		%	24.4	24.4	0	24.4	24.4	0		
1AGO004.89	6	22.1	21.5	2.16703	9.81%	20	25.3	5.3	20.2	24.1	3.9	0.687358	-0.668095
1AGO011.23	297	13.1521	12.72	8.18894	62.26%	-0.08	28.12	28.2	6	21.11	15.11	0.290179	-4.65381
1AGO014.44	56	14.0675	15.56	8.16226	58.02%	0	26.11	26.11	6.115	21.11	14.995	-0.702481	-2.15537
1AGO021.28	6	16.1	16.1	3.89E-15	2.42E-16	16.1	16.1	0	16.1	16.1	0	1.36931	-1.66667
1AGO022.44	431	13.2586	13.16	7.97986	60.19%	0	29	29	6.6	19.9	13.3	-0.0912195	-5.21039
1AGO030.75	168	13.2967	13.79	8.44171	63.49%	0	27.7	27.7	5.28	20.88	15.6	-0.167537	-3.58585
1AGO034.20	36	14.3358	13.69	8.45692	58.99%	-0.08	23.68	23.76	6.875	22.865	15.99	-0.772583	-1.6478
1AGO036.47	8	13.6	15.7	3.88844	28.59%	7.3	15.7	8.4	11.5	15.7	4.2	-1.66296	1.03E-15
1AGO036.61	30	12.663	12.6	6.93855	54.79%	0.72	21.62	20.9	12.37	17.47	5.1	-1.47438	-0.509406
1AGO044.36	382	12.9866	12.55	7.50203	57.77%	0	26.9	26.9	6.6	19.2	12.6	0.479456	-4.77355
1AGO046.37	18	15.1167	12.5	3.89545	25.77%	12.38	20.47	8.09	12.38	20.47	8.09	1.33801	-1.38023
1AHOW003.68	12	16.675	19.85	8.80187	52.78%	2.6	24.4	21.8	10.35	23	12.65	-1.4966	-0.434979
1AHPR002.28	9	13.4567	11.11	7.20485	53.54%	2.22	22.22	20	8.89	20.56	11.67	-0.110346	-0.953817
1AHPR003.87	245	13.924	14.6	7.72966	55.51%	0	29	29	7.2	20.1	12.9	0.339653	-3.85871
1AHPR004.91	2	3.9	3.9	4.10122	105.16%	1	6.8	5.8	1	6.8	5.8		
1AHPR006.51	1	1	1		%	1	1	0	1	1	0		
1AINI000.80	1	6	6		%	6	6	0	6	6	0		
1AJEE002.22	1	7	7		%	7	7	0	7	7	0		
1AJEE004.84	1	7	7		%	7	7	0	7	7	0		
1ALII003.97	131	13.3616	12.3	7.86762	58.88%	0	27	27	7.36	20.22	12.86	-0.197348	-2.50589
1ALII006.75	27	16.0022	18.6	7.3883	46.17%	5.33	24.1	18.77	10.3	23.32	13.02	-0.716403	-1.67687
1ALIM001.16	183	12.8313	13.16	6.378	49.71%	0.4	26.11	25.71	7.19	18.47	11.28	-0.666433	-3.04903
1ALIM001.80	15	20.52	23.5	8.30699	40.48%	5	27.9	22.9	21.6	24.6	3	-2.21015	0.377583
1ALIV001.70	74	11.2245	8.68	7.72656	68.84%	0.14	24.25	24.11	4.63	17.52	12.89	1.02888	-2.16865
1ALIV004.78	165	12.0525	11.8	7.82427	64.92%	0.01	25.1	25.09	4.5	18.7	14.2	0.185464	-3.32777
1ALIV005.76	15	15.5487	16.19	8.26689	53.17%	0.6	26	25.4	10	22	12	-1.22544	-0.468382
1ALIV006.92	32	14.4169	17.91	7.67353	53.23%	0.04	22.41	22.37	5.79	20.53	14.74	-1.69614	-1.16684
1ALIV012.12	9	9.56667	10.1	6.93974	72.54%	1.3	17.3	16	1.3	17.3	16	-0.180721	-1.04978
1ALNR001.04	1	22	22		%	22	22	0	22	22	0		
1AMIH001.98	32	14.8994	19.08	7.50945	50.40%	0.16	22.78	22.62	7.14	20.415	13.275	-1.96004	-0.887737
1ANOB005.49	61	12.6185	12.56	6.24669	49.50%	2.02	21.32	19.3	8.19	19.05	10.86	-0.745133	-1.68243
1ANOC000.42	167	13.6663	14	7.62754	55.81%	0.5	28.5	28	7.3	19.72	12.42	-0.185593	-3.11487
1ANOC004.38	103	13.4664	14.4	8.48272	62.99%	0	26.67	26.67	4.6	21	16.4	-1.03068	-2.98223
1ANOC007.28	16	20.2688	22.7	9.11919	44.99%	3	30.2	27.2	21.3	23.6	2.3	-2.02606	0.45912

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

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1ANOC009.13	66	14.1561	14.1	7.93122	56.03%	2	24.62	22.62	7.3	21.4	14.1	-0.898326	-2.42681
1ANOC009.37	32	14.7184	18.13	7.47096	50.76%	0.55	22.65	22.1	7.23	20.365	13.135	-1.82802	-1.02432
1ANOC011.74	1	21.5	21.5		%	21.5	21.5	0	21.5	21.5	0		
1ANOG000.08	15	19.24	22.9	8.19641	42.60%	3.7	25.5	21.8	20.7	23.4	2.7	-2.40207	0.504427
1ANOG000.91	6	14.28	14.28	0	0.00%	14.28	14.28	0	14.28	14.28	0		
1ANOG005.69	400	13.3309	14.25	7.99133	59.95%	0	28.5	28.5	5.68	20.2	14.52	0.270039	-5.24878
1ANOG011.60	32	15.9356	15.8	7.71179	48.39%	5.63	26.3	20.67	10.3	24.34	14.04	0.0523846	-1.82126
1APAE004.21	36	14.1817	14.91	8.19699	57.80%	0.4	23.4	23	7.105	22.215	15.11	-0.979985	-1.63434
1APIA001.80	181	11.8563	12.82	6.76008	57.02%	0	24.3	24.3	6.35	16.88	10.53	-0.70236	-3.00596
1APOT170.40	107	14.357	13.33	9.05292	63.06%	0	28.89	28.89	6.67	23	16.33	-0.0440456	-2.98476
1ASFS000.28	65	13.0554	14.8	7.65479	58.63%	0.8	22.3	21.5	6.7	20.8	14.1	-0.708323	-2.51652
1ASOC000.01	2	17.7	17.7	0	0.00%	17.7	17.7	0	17.7	17.7	0		
1ASOC001.66	244	13.9485	14.43	8.02763	57.55%	0	29	29	7.2	21	13.8	-0.278671	-3.99436
1ASOC005.46	1	22	22		%	22	22	0	22	22	0		
1ASOC007.06	90	14.2254	17.96	7.65771	53.83%	-0.06	23.2	23.26	6.2	20.63	14.43	-1.68566	-2.60338
1ASOC010.09	7	13.9	16.46	4.37203	31.45%	7.5	16.46	8.96	7.5	16.46	8.96	-1.32816	-0.453652
1ASOC011.82	64	14.1189	14.445	8.61946	61.05%	0.4	29	28.6	6.835	21.805	14.97	-0.06922	-2.04999
1ASOC012.38	109	12.865	12.4	7.71132	59.94%	0.5	25.56	25.06	7.4	21	13.6	-0.203656	-2.93776
1ASOR000.59	1	19.5	19.5		%	19.5	19.5	0	19.5	19.5	0		
1ASOR002.99	24	17.7075	18.78	5.83077	32.93%	8.76	24.51	15.75	13.31	22.105	8.795	-1.13018	-0.924204
1ASUG000.05	2	25.2	25.2	1.55563	6.17%	24.1	26.3	2.2	24.1	26.3	2.2		
1ASUG004.42	355	13.5421	14.47	7.29789	53.89%	0	27	27	7.3	19.8	12.5	-1.50435	-4.34497
1ASUG008.46	29	14.5793	16.11	9.00504	61.77%	1.11	27.78	26.67	6.67	21.7	15.03	-0.115956	-1.66724
1ASUG009.07	2	27.15	27.15	1.06066	3.91%	26.4	27.9	1.5	26.4	27.9	1.5		
1ASYC002.03	151	12.5791	11.5	7.03206	55.90%	1.1	25.1	24	6	19.71	13.71	0.792819	-3.21694
1ASYC004.93	60	14.3583	14.8	7.20239	50.16%	2.4	25.07	22.67	8	20.64	12.64	-0.521009	-2.12486
1ASYC006.23	1	4.5	4.5		%	4.5	4.5	0	4.5	4.5	0		
1ASYC007.43	71	13.1638	14.9	7.83668	59.53%	1.1	25.12	24.02	6.9	20.75	13.85	-0.534502	-2.37653
1ASYC009.78	1	7.5	7.5		%	7.5	7.5	0	7.5	7.5	0		
1ATUS000.04	28	15.3143	18.11	7.56656	49.41%	0.08	23.37	23.29	8.02	21.64	13.62	-1.63572	-0.862693
1ATUS000.37	390	12.9109	12.71	7.51426	58.20%	0	27.6	27.6	6	19.87	13.87	0.227889	-5.15494
1ATUS003.19	82	14.1066	15.56	7.8123	55.38%	0.56	30.56	30	6.11	21	14.89	-0.163879	-2.19987
1AWAC003.31	6	14.6	14.6	0	0.00%	14.6	14.6	0	14.6	14.6	0		
1AXAC000.09	2	11.25	11.25	1.06066	9.43%	10.5	12	1.5	10.5	12	1.5		
1AXAQ000.85	27	15.1556	15.4	6.54098	43.16%	6.84	25.1	18.26	9.67	21.64	11.97	0.405789	-1.65566
1AXBLO00.28	1	23	23		%	23	23	0	23	23	0		
1AXCO000.39	6	20.4667	22.3	5.80643	28.37%	9.8	25.1	15.3	18.2	25.1	6.9	-1.55395	1.15997
1AXCO000.92	4	24.6	24.6	0.11547	0.47%	24.5	24.7	0.2	24.5	24.7	0.2	-7.54E-14	-2.44949

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

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1AXCO000.96	4	25.15	25.15	2.02073	8.03%	23.4	26.9	3.5	23.4	26.9	3.5	0	-2.44949
1AXDI000.01	4	24.5	24.5	0.34641	1.41%	24.2	24.8	0.6	24.2	24.8	0.6	0	-2.44949
1AXGB000.07	1	15.2	15.2		%	15.2	15.2	0	15.2	15.2	0		
1AXGJ000.42	15	18.78	21	8.26742	44.02%	3.5	25.6	22.1	19.2	24.6	5.4	-2.10468	0.247331
1AXGU000.18	8	15.2	14.8	0.740656	4.87%	14.8	16.4	1.6	14.8	15.6	0.8	1.66296	6.15E-15
1AXJT002.22	32	15.2763	19.35	7.69696	50.39%	0.12	23.13	23.01	7.41	21.205	13.795	-1.99481	-0.871125
1AXKR000.77	6	13.14	13.14	0	0.00%	13.14	13.14	0	13.14	13.14	0		
1AXLE001.62	7	7.02857	8.5	8.07315	114.86%	0.3	22.8	22.5	0.3	8.5	8.2	1.44588	1.12015

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

pH (Standard Units)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABEC004.76	257	7.21136	7.2	0.399737	5.54%	5.7	8.27	2.57	7.02	7.4	0.38	-3.26876	10.7002
1ABEC011.19	66	7.19924	7.06	0.48696	6.76%	6.54	8.31	1.77	7	7.4	0.4	3.26411	0.789723
1ABEE000.40	2	7.5	7.5	0.424264	5.66%	7.2	7.8	0.6	7.2	7.8	0.6		
1ABEE001.40	2	7.5	7.5	0	0.00%	7.5	7.5	0	7.5	7.5	0		
1ABEM000.60	22	8.14091	7.8	1.0595	13.01%	7.3	10.7	3.4	7.7	8	0.3	4.03397	2.94991
1ABIR000.76	43	7.21163	7.2	0.225947	3.13%	6.8	7.8	1	7	7.3	0.3	0.0819174	0.013035
1ABIR005.21	2	7.35	7.35	0.494975	6.73%	7	7.7	0.7	7	7.7	0.7		
1ABOL002.56	60	7.101	7.04	0.396342	5.58%	6.35	8.03	1.68	6.935	7.285	0.35	1.07694	1.36266
1ABRB002.15	433	7.36046	7.4	0.398792	5.42%	6	8.5	2.5	7.2	7.6	0.4	-3.91806	2.30541
1ABRB006.33	31	7.57323	7.6	0.234782	3.10%	7.1	7.88	0.78	7.48	7.8	0.32	-1.72351	-0.035263
1ABRB015.04	7	7.45286	7.5	0.087505	1.17%	7.36	7.53	0.17	7.36	7.53	0.17	-0.346034	-1.47968
1ABRB015.38	2	7.85	7.85	0.494975	6.31%	7.5	8.2	0.7	7.5	8.2	0.7		
1ABUL016.31	24	7.605	7.51	0.361446	4.75%	7.15	8.4	1.25	7.385	7.75	0.365	2.36953	1.01956
1ABUL025.94	181	7.63519	7.5	0.494018	6.47%	6.6	9.2	2.6	7.38	7.85	0.47	5.20759	3.49502
1ABUT000.69	1	7.3	7.3		%	7.3	7.3	0	7.3	7.3	0		
1ACAA000.83	6	7.8	7.8	0	0.00%	7.8	7.8	0	7.8	7.8	0		
1ACAA003.46	28	7.2825	7.4	0.453673	6.23%	6.13	7.9	1.77	7.3	7.465	0.165	-3.5443	3.14112
1ACAA008.01	1	7.5	7.5		%	7.5	7.5	0	7.5	7.5	0		
1ACAX000.19	52	7.80577	7.6	0.674875	8.65%	7	9.5	2.5	7.25	8.4	1.15	2.00561	-0.922712
1ACAX004.57	434	7.42809	7.4	0.430555	5.80%	6.4	9.5	3.1	7.2	7.62	0.42	6.99498	15.4137
1ACAX008.61	1	6.9	6.9		%	6.9	6.9	0	6.9	6.9	0		
1ACLK002.40	36	7.67667	7.7	0.171181	2.23%	7.2	7.81	0.61	7.65	7.8	0.15	-4.58189	3.78139
1ACRA000.42	36	7.065	7.12	0.533685	7.55%	6.32	8.06	1.74	6.79	7.13	0.34	1.60947	-0.031744
1ACRF001.18	27	7.69111	7.7	0.225189	2.93%	7.18	8	0.82	7.61	7.8	0.19	-2.17828	1.18861
1ACRM001.20	147	7.0266	7.03	0.337936	4.81%	5.8	7.9	2.1	6.9	7.2	0.3	-6.51222	11.591
1ACRM009.86	8	7.5	7.6	0.185164	2.47%	7.2	7.6	0.4	7.4	7.6	0.2	-1.66296	3.44E-14
1ACUB002.61	123	7.6887	7.66	0.320392	4.17%	7.1	8.4	1.3	7.45	7.85	0.4	1.41871	-0.848294
1ACUB003.74	138	7.37609	7.4	0.417589	5.66%	6	8.2	2.2	7.2	7.62	0.42	-3.30576	1.77546
1ACUB008.60	54	7.6613	7.41	0.51169	6.68%	7.04	9	1.96	7.34	8	0.66	3.23271	0.521964
1ADRL001.00	1	7.5	7.5		%	7.5	7.5	0	7.5	7.5	0		
1ADUT000.62	62	7.80806	7.8	0.507743	6.50%	6.8	8.8	2	7.4	8.1	0.7	0.899613	-1.10686
1ADUT002.72	7	7.42143	7.4	0.162934	2.20%	7.3	7.75	0.45	7.3	7.5	0.2	1.78096	1.4986
1AELC001.39	67	7.67448	7.49	0.431591	5.62%	7.21	8.86	1.65	7.44	7.69	0.25	6.1076	4.62026
1AFLB000.64	23	7.74783	7.7	0.535868	6.92%	7	9.5	2.5	7.5	7.8	0.3	3.85893	4.57381
1AFLB001.40	26	7.51923	7.5	0.384728	5.12%	6.9	8.5	1.6	7.4	7.7	0.3	1.41826	1.31542
1AFLB002.53	2	7.45	7.45	0.212132	2.85%	7.3	7.6	0.3	7.3	7.6	0.3		
1AFLL000.62	6	7.5	7.5	0	0.00%	7.5	7.5	0	7.5	7.5	0		
1AFOL000.53	3	7.3	7.3	0.3	4.11%	7	7.6	0.6	7	7.6	0.6	0	
1AFOL001.52	1	7.1	7.1		%	7.1	7.1	0	7.1	7.1	0		

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

pH (Standard Units)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1AFRY000.60	1	7.3	7.3		%	7.3	7.3	0	7.3	7.3	0		
1AGAR002.24	48	7.22979	7.105	0.446235	6.17%	6.77	8.27	1.5	6.925	7.35	0.425	4.11024	1.90135
1AGOO002.38	495	7.49877	7.5	0.445259	5.94%	6	9	3	7.27	7.7	0.43	3.00942	5.72858
1AGOO003.82	1	7	7		%	7	7	0	7	7	0		
1AGOO004.89	3	7.56667	7.4	0.288675	3.82%	7.4	7.9	0.5	7.4	7.9	0.5	1.22474	
1AGOO011.23	297	7.36949	7.3	0.44504	6.04%	6.3	9.3	3	7.12	7.5	0.38	9.39176	11.9893
1AGOO014.44	56	7.38036	7.25	0.574114	7.78%	6.5	9.2	2.7	7	7.7	0.7	3.05433	1.17172
1AGOO021.28	6	8	8	0	0.00%	8	8	0	8	8	0		
1AGOO022.44	408	7.33576	7.3	0.412753	5.63%	6.1	9.5	3.4	7.1	7.5	0.4	5.41625	13.5623
1AGOO030.75	168	7.33256	7.3	0.503139	6.86%	5.98	9	3.02	7	7.67	0.67	1.0639	2.76195
1AGOO034.20	36	7.33	7.255	0.492568	6.72%	6.65	8.45	1.8	6.955	7.48	0.525	2.35359	0.519516
1AGOO036.47	8	7.75	7.8	0.092582	1.19%	7.6	7.8	0.2	7.7	7.8	0.1	-1.66296	1.28E-14
1AGOO036.61	30	7.48033	7.48	0.563496	7.53%	6.77	8.44	1.67	7.21	7.57	0.36	1.37089	-0.590275
1AGOO044.36	362	7.28644	7.385	0.503352	6.91%	5.89	9.1	3.21	7	7.57	0.57	0.770654	3.64527
1AGOO046.37	23	7.25739	7.26	0.043612	0.60%	7.2	7.32	0.12	7.24	7.32	0.08	0.582696	-1.00813
1AHOW003.68	12	7.25	7.2	0.227636	3.14%	7	7.6	0.6	7.1	7.4	0.3	1.05941	-0.496041
1AHPR000.32	1	7.8	7.8		%	7.8	7.8	0	7.8	7.8	0		
1AHPR002.28	8	7.9125	7.75	0.574301	7.26%	7.3	8.7	1.4	7.45	8.45	1	0.576407	-0.92979
1AHPR003.87	231	7.5913	7.7	0.566243	7.46%	6.2	9.4	3.2	7.2	7.9	0.7	1.94228	1.91485
1AHPR004.91	2	7.65	7.65	0.212132	2.77%	7.5	7.8	0.3	7.5	7.8	0.3		
1AHPR006.51	1	7.5	7.5		%	7.5	7.5	0	7.5	7.5	0		
1AINI000.80	1	8.5	8.5		%	8.5	8.5	0	8.5	8.5	0		
1AJEE002.22	1	7.9	7.9		%	7.9	7.9	0	7.9	7.9	0		
1AJEE004.84	1	7.6	7.6		%	7.6	7.6	0	7.6	7.6	0		
1ALII003.97	121	7.51314	7.6	0.436014	5.80%	6.6	8.7	2.1	7.3	7.73	0.43	-0.96581	0.117469
1ALII006.75	27	7.49	7.5	0.153723	2.05%	7.24	7.8	0.56	7.4	7.57	0.17	0.943118	0.194393
1ALIM001.16	178	7.54208	7.58	0.716182	9.50%	4.4	9.2	4.8	7.4	7.8	0.4	-11.213	24.0699
1ALIM001.80	15	7.84	7.7	0.572962	7.31%	7.4	8.9	1.5	7.4	7.8	0.4	2.1155	0.255468
1ALIV001.70	74	7.22986	7.12	0.271053	3.75%	6.97	7.9	0.93	7.06	7.36	0.3	5.2971	2.21605
1ALIV004.78	154	7.06104	7.1	0.498461	7.06%	5.7	8.2	2.5	6.8	7.3	0.5	-2.36054	0.953448
1ALIV005.76	15	7.39333	7.3	0.252039	3.41%	6.9	7.9	1	7.3	7.5	0.2	0.380845	0.514559
1ALIV006.92	32	7.21719	7.21	0.291827	4.04%	6.97	8.02	1.05	6.99	7.27	0.28	4.49443	4.16461
1ALIV012.12	10	7.54	7.6	0.150555	2.00%	7.3	7.7	0.4	7.4	7.7	0.3	-0.479187	-1.02544
1ALIV016.50	1	7.3	7.3		%	7.3	7.3	0	7.3	7.3	0		
1ALIV018.08	1	7.3	7.3		%	7.3	7.3	0	7.3	7.3	0		
1ALNR001.04	2	7.35	7.35	0.494975	6.73%	7	7.7	0.7	7	7.7	0.7		
1AMIH001.98	33	7.47909	7.47	0.27977	3.74%	6.97	7.91	0.94	7.33	7.63	0.3	-0.561984	-0.586157
1ANOB005.49	66	7.31742	7.305	0.538463	7.36%	6.27	8.5	2.23	7.05	7.49	0.44	1.67425	0.957614
1ANOC000.42	162	7.41136	7.4	0.544538	7.35%	6.2	9.5	3.3	7.1	7.6	0.5	4.8503	5.78165

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

pH (Standard Units)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ANOC004.38	89	7.3118	7.3	0.380611	5.21%	6.6	8.3	1.7	7	7.6	0.6	0.140967	-0.002763
1ANOC007.28	17	7.48824	7.4	0.22606	3.02%	7	7.8	0.8	7.4	7.6	0.2	-0.155992	-0.166141
1ANOC009.13	46	7.2	7.32	0.524426	7.28%	5.9	8.6	2.7	7.18	7.42	0.24	-3.44505	4.06944
1ANOC009.37	32	7.425	7.44	0.250148	3.37%	6.86	7.9	1.04	7.36	7.53	0.17	-1.04585	1.58678
1ANOC011.74	1	7.7	7.7		%	7.7	7.7	0	7.7	7.7	0		
1ANOOG000.08	15	7.46	7.3	0.241424	3.24%	7.3	7.9	0.6	7.3	7.5	0.2	2.027	0.046644
1ANOOG000.91	6	7.04	7.04	0	0.00%	7.04	7.04	0	7.04	7.04	0		
1ANOOG005.69	394	7.46129	7.4	0.629173	8.43%	5.6	9.5	3.9	7.11	7.71	0.6	4.29966	6.72576
1ANOOG011.60	32	7.7625	7.81	0.267847	3.45%	7.3	8.7	1.4	7.6	7.9	0.3	2.23346	4.30588
1APAE004.21	36	7.2975	7.3	0.558403	7.65%	6.04	8.43	2.39	7.075	7.405	0.33	-0.236774	1.68944
1APIA000.18	1	7	7		%	7	7	0	7	7	0		
1APIA001.80	175	7.23669	7.28	0.492498	6.81%	5.1	8.01	2.91	7.1	7.5	0.4	-11.4477	22.2284
1APIA004.67	1	7	7		%	7	7	0	7	7	0		
1APIA007.08	1	7	7		%	7	7	0	7	7	0		
1APOT170.40	107	8.53551	8.7	0.661652	7.75%	6.7	9.5	2.8	8	9	1	-2.54005	-0.897448
1ASFS000.28	46	7.225	7.2	0.247644	3.43%	6.7	7.54	0.84	7.1	7.4	0.3	-1.91991	-0.005488
1ASOC000.01	2	7.8	7.8	0	0.00%	7.8	7.8	0	7.8	7.8	0		
1ASOC001.66	239	7.45841	7.4	0.506212	6.79%	6.4	9.3	2.9	7.1	7.7	0.6	5.56387	4.5126
1ASOC005.46	3	7.2	7.1	0.264575	3.67%	7	7.5	0.5	7	7.5	0.5	1.03086	
1ASOC007.06	75	7.40773	7.4	0.295962	4.00%	6.8	8.03	1.23	7.23	7.6	0.37	-0.687056	-0.496906
1ASOC008.46	2	7.05	7.05	0.070711	1.00%	7	7.1	0.1	7	7.1	0.1		
1ASOC010.09	7	8.55714	8.5	0.09759	1.14%	8.5	8.7	0.2	8.5	8.7	0.2	1.32816	-0.453652
1ASOC011.82	64	7.48297	7.5	1.08684	14.52%	0.07	9	8.93	7.2	7.825	0.625	-16.4089	57.1141
1ASOC012.38	88	7.43068	7.4	0.472778	6.36%	6.7	9.8	3.1	7.2	7.65	0.45	7.86787	16.1952
1ASOC014.58	4	7.5	7.5	0.522813	6.97%	7	8	1	7.05	7.95	0.9	0	-2.30195
1ASOC015.92	2	7.05	7.05	0.070711	1.00%	7	7.1	0.1	7	7.1	0.1		
1ASOR000.59	2	7.7	7.7	0.565685	7.35%	7.3	8.1	0.8	7.3	8.1	0.8		
1ASOR002.99	24	7.06	7.05	0.065408	0.93%	6.99	7.15	0.16	7	7.12	0.12	0.585779	-1.64555
1ASUG000.05	2	7.45	7.45	0.212132	2.85%	7.3	7.6	0.3	7.3	7.6	0.3		
1ASUG004.42	339	7.37652	7.4	0.390905	5.30%	5.9	9.7	3.8	7.2	7.6	0.4	3.41485	16.9547
1ASUG008.46	27	7.57407	7.4	0.890373	11.76%	6	10	4	7	8	1	1.95127	0.951853
1ASUG009.07	2	7.9	7.9	0	0.00%	7.9	7.9	0	7.9	7.9	0		
1ASYC002.03	152	7.42079	7.4	0.299219	4.03%	6.6	8.2	1.6	7.28	7.6	0.32	1.85741	2.11576
1ASYC004.93	45	7.37889	7.41	0.239338	3.24%	6.9	7.7	0.8	7.3	7.58	0.28	-1.937	-0.440902
1ASYC006.23	1	7.7	7.7		%	7.7	7.7	0	7.7	7.7	0		
1ASYC007.43	51	7.32627	7.4	0.234827	3.21%	6.9	7.66	0.76	7.3	7.52	0.22	-2.54091	-0.375551
1ASYC009.78	1	7.3	7.3		%	7.3	7.3	0	7.3	7.3	0		
1ATOW000.60	1	8.6	8.6		%	8.6	8.6	0	8.6	8.6	0		
1ATUS000.04	28	7.90607	7.93	0.263837	3.34%	7.44	8.3	0.86	7.7	8.05	0.35	-0.493085	-0.956119

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

pH (Standard Units)	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ATUS000.37	377	7.6595	7.69	0.490896	6.41%	6.35	9	2.65	7.4	7.92	0.52	1.48845	0.567567
1ATUS003.19	82	7.83171	7.8	0.623387	7.96%	6.2	10	3.8	7.5	8.2	0.7	1.01828	2.10403
1AWAC003.31	6	7.1	7.1	9.73E-16	1.37E-16	7.1	7.1	0	7.1	7.1	0	-1.36931	-1.66667
1AXAC000.09	3	7.43333	7.4	0.152753	2.05%	7.3	7.6	0.3	7.3	7.6	0.3	0.6613	
1AXAQ000.85	27	7.92111	7.92	0.122139	1.54%	7.7	8.1	0.4	7.9	8	0.1	-1.25235	-0.544561
1AXBL000.28	1	7.6	7.6	%	7.6	7.6	0	7.6	7.6	7.6	0		
1AXCO000.39	6	7.25	7.3	0.122474	1.69%	7.1	7.4	0.3	7.1	7.3	0.2	-0.489898	-0.733333
1AXCO000.92	4	7.4	7.4	0.11547	1.56%	7.3	7.5	0.2	7.3	7.5	0.2	-1.87E-14	-2.44949
1AXCO000.96	4	7.35	7.35	0.057735	0.79%	7.3	7.4	0.1	7.3	7.4	0.1	-3.77E-14	-2.44949
1AXDI000.01	4	7.5	7.5	0	0.00%	7.5	7.5	0	7.5	7.5	0		
1AXGB000.07	2	8	8	0.282843	3.54%	7.8	8.2	0.4	7.8	8.2	0.4		
1AXGJ000.42	15	7.66	7.6	0.250143	3.27%	7.4	8.1	0.7	7.5	7.7	0.2	1.58257	-0.135933
1AXGU000.18	8	7.325	7.4	0.138873	1.90%	7.1	7.4	0.3	7.25	7.4	0.15	-1.66296	5.13E-16
1AXJT002.22	32	7.23781	7.28	0.157741	2.18%	6.9	7.44	0.54	7.17	7.33	0.16	-2.46405	0.100102
1AXKR000.77	6	6.98	6.98	9.73E-16	1.39E-16	6.98	6.98	0	6.98	6.98	0	-1.36931	-1.66667
1AXLE001.62	7	7.04286	7.3	0.320713	4.55%	6.7	7.3	0.6	6.7	7.3	0.6	-0.404145	-1.51217

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

DO (probe) mg/L	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABEC004.76	227	9.89471	10.19	2.29207	23.16%	3.9	14.2	10.3	8.24	11.54	3.3	-1.93406	-1.58011
1ABEC011.19	66	9.08485	7.98	3.33463	36.71%	3.13	13.58	10.45	6.69	11.76	5.07	-0.8282	-1.88617
1ABEE000.40	2	6.95	6.95	0.353553	5.09%	6.7	7.2	0.5	6.7	7.2	0.5		
1ABEE001.40	2	7.3	7.3	1.55563	21.31%	6.2	8.4	2.2	6.2	8.4	2.2		
1ABEM000.60	19	11.2737	10.9	1.84205	16.34%	8.1	14.9	6.8	10	11.9	1.9	1.7539	0.638498
1ABOL002.56	60	9.82733	9.78	1.98409	20.19%	6.91	14.63	7.72	8.04	11.52	3.48	1.54433	-0.48343
1ABRB002.15	265	8.90234	8.5	2.6083	29.30%	4.58	15.08	10.5	6.62	11.1	4.48	1.60912	-3.38037
1ABRB006.33	31	9.45258	9.9	2.48802	26.32%	3.2	13.2	10	8.2	10.9	2.7	-1.75009	0.260608
1ABRB015.04	6	9.075	9.075	1.86773	20.58%	7.37	10.78	3.41	7.37	10.78	3.41	-3.026E-15	-1.66667
1ABUL016.31	24	9.80375	9.1	2.89324	29.51%	6.5	14.6	8.1	7.185	12.38	5.195	1.00748	-1.23078
1ABUL025.94	168	10.0935	9.25	2.95326	0.292591	5.3	16.4	11.1	7.55	12.5	4.95	2.20207	-2.28007
1ACAA000.83	6	12.3	12.3	1.95E-15	0.00%	12.3	12.3	0	12.3	12.3	0	1.36931	-1.66667
1ACAA003.46	27	9.95	9	2.18018	0.219114	7.4	14.6	7.2	8.59	10.4	1.81	2.33047	0.262097
1ACAX004.57	308	10.1149	10	2.47978	0.245161	5.13	16.73	11.6	8.335	12	3.665	0.785574	-1.47591
1ACLK002.40	33	10.9564	10.64	2.20756	20.15%	7.53	14	6.47	8.8	13.5	4.7	-0.327977	-1.47355
1ACRA000.42	36	9.06139	8.97	1.88348	20.79%	6.95	12.37	5.42	7.04	9.96	2.92	1.45789	-0.907627
1ACRF001.18	24	10.74	10.25	2.20632	20.54%	8.19	14.9	6.71	9.055	12.11	3.055	1.34507	-0.692989
1ACRM001.20	155	9.7131	9.6	2.4245	24.96%	4.2	14.4	10.2	7.6	11.34	3.74	0.585341	-2.35E+00
1ACRM009.86	8	10.6	10.9	0.555492	5.24%	9.7	10.9	1.2	10.3	10.9	0.6	-1.66296	1.43581E-14
1ACUB002.61	117	10.3217	9.83	2.56678	0.248678	6.36	15.13	8.77	8.3	13	4.7	1.49671	-2.25809
1ACUB003.74	94	9.4	9.295	2.91045	30.96%	4.9	15.8	10.9	7.1	10.8	3.7	2.64253	-0.588678
1ACUB008.60	52	9.69577	9.18	3.40568	35.13%	4.72	14.94	10.22	6.93	11	4.07	0.805172	-1.68461
1ADUT000.62	22	10.8182	9.2	2.94936	27.26%	7.9	16.6	8.7	8.8	13.8	5	2.09038	-0.217614
1ADUT002.72	6	8.46667	7.8	1.69076	19.97%	7.4	11.8	4.4	7.4	8.6	1.2	2.11157	2.29039
1AELC001.39	67	9.46284	8.67	2.9238	30.90%	6.19	15.74	9.55	6.52	11.65	5.13	2.41385	-0.636349
1AFLL000.62	6	7.8	7.8	0	0.00%	7.8	7.8	0	7.8	7.8	0		
1AGAR002.24	48	10.1533	10.295	2.10974	20.78%	6.96	13.3	6.34	8.42	12.08	3.66	0.161585	-1.87561
1AGO0002.38	335	10.4338	10.55	2.52327	24.18%	4.96	14.8	9.84	8.2	12.7	4.5	-1.61431	-3.50116
1AGO0003.82	1	8.2	8.2	%	8.2	8.2	0	8.2	8.2	0			
1AGO0004.89	1	8.5	8.5	%	8.5	8.5	0	8.5	8.5	0			
1AGO0011.23	162	10.4683	10.36	2.46304	23.53%	6.45	15.89	9.44	7.99	12.49	4.5	1.0427	-2.45844
1AGO0021.28	6	11.7	11.7	1.95E-15	0.00%	11.7	11.7	0	11.7	11.7	0	-1.36931	-1.66667
1AGO0022.44	255	10.0147	10.1	2.30916	0.230578	5.3	14.8	9.5	8.07	11.83	3.76	-0.40069	-2.632
1AGO0030.75	78	10.8369	10.68	3.06057	28.24%	5.9	15.1	9.2	7.83	13.7	5.87	-0.264966	-2.4188
1AGO0034.20	36	10.3458	9.615	2.79369	27.00%	6.32	15.17	8.85	7.69	13.01	5.32	0.597379	-1.54542
1AGO0036.47	8	12.15	11.7	0.833238	6.86%	11.7	13.5	1.8	11.7	12.6	0.9	1.66296	-6.1535E-15

Summary Statistics for Sites Sampled by DEQ in Loudoun County or contributing watersheds.

DO (probe) mg/L	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1AGO0036.61	30	10.4537	9.45	2.15076	0.205742	8.3	14.06	5.76	8.81	11.53	2.72	1.63781	-1.06955
1AGO0044.36	307	10.6285	10.7	2.41944	0.227637	5.78	16.03	10.25	8.7	12.17	3.47	0.0179479	-2.60669
1AGO0046.37	23	9.19478	10.12	1.21259	0.131878	7.7	10.5	2.8	8.21	10.5	2.29	-0.237057	-1.96652
1AHOW003.68	12	9.075	7.75	3.8165	0.420551	5.7	15.1	9.4	6.2	11.95	5.75	1.38917	-0.52127
1AHPR003.87	103	10.45	10.9	2.6578	25.43%	6.28	17.4	11.12	8.36	11.5	3.14	1.76787	0.172782
1ALII003.97	110	9.90673	9.85	2.87102	0.289806	5.1	15.2	10.1	7	12.1	5.1	1.44699	-2.22584
1ALII006.75	27	10.7067	11.5	2.067	0.193057	8	12.9	4.9	8.8	12.79	3.99	-0.383751	-2.05543
1ALIM001.16	158	10.3959	10	2.29345	22.06%	6	16.5	10.5	8.8	12.2	3.4	2.40651	-1.01209
1ALIM001.80	15	9.72	8.6	3.27549	33.70%	5.9	14.2	8.3	7.3	12.6	5.3	0.472601	-1.34865
1ALIV001.70	74	10.4904	10.6	2.73584	26.08%	5.99	15.5	9.51	8.88	12.9	4.02	-0.426175	-1.70769
1ALIV004.78	162	10.136	10.02	2.53484	25.01%	6.2	15.6	9.4	7.9	12.4	4.5	1.55501	-2.26421
1ALIV006.92	26	8.85808	8.48	2.34132	26.43%	6.24	12.79	6.55	7.3	8.9	1.6	1.75382	-0.697236
1ALIV012.12	9	12.7667	12.8	1.60234	12.55%	10.9	14.6	3.7	10.9	14.6	3.7	-0.0491206	-1.04978
1AMIH001.98	26	9.84462	9.32	2.39955	24.37%	6.91	14.17	7.26	8.46	9.97	1.51	1.57755	-0.60849
1ANOB005.49	66	10.9103	10.95	2.27868	20.89%	7.41	16.6	9.19	8.72	11.78	3.06	1.61777	0.496133
1ANOC000.42	89	9.72494	10.1	2.43832	25.07%	5.6	14.1	8.5	7.9	11.5	3.6	0.0204148	-1.85831
1ANOC004.38	59	9.3	6.7	4.24293	45.62%	4.8	18.1	13.3	5.88	13.9	8.02	2.44498	-1.06469
1ANOC007.28	15	8.08	8	3.09105	0.382555	4.7	13.4	8.7	5.9	8.4	2.5	1.34524	-0.255827
1ANOC009.13	65	10.6623	10.1	3.51957	33.01%	5.86	17.6	11.74	7.6	13.9	6.3	1.33406	-1.48465
1ANOC009.37	26	9.84154	9.32	2.20942	0.224499	7	13.76	6.76	8.39	10.2	1.81	1.48641	-0.657438
1ANOOG000.08	15	8.9	7.9	2.77336	31.16%	6.3	13.6	7.3	6.7	10	3.3	1.39121	-0.515572
1ANOOG000.91	6	10.27	10.27	1.95E-15	0.00%	10.27	10.27	0	10.27	10.27	0	1.36931	-1.66667
1ANOOG005.69	218	10.5389	10.8	2.58387	24.52%	5.83	16.1	10.27	8.3	12.95	4.65	-0.0655446	-2.70058
1ANOOG011.60	24	10.4275	9.75	2.39758	22.99%	7.68	15.9	8.22	8.995	11.175	2.18	2.81074	1.52612
1APAE004.21	36	10.6858	10.21	2.47876	23.20%	7.73	15.4	7.67	8.59	12.585	3.995	1.59981	-1.02647
1APIA001.80	178	10.1893	10	2.15367	21.14%	5.76	15.05	9.29	8.55	11.7	3.15	1.34925	-1.30947
1ASFS000.28	65	10.0492	8.9	3.36423	33.48%	5.4	16.4	11	7.08	12.2	5.12	1.29391	-1.57853
1ASOC000.01	2	11.4	11.4	0	0.00%	11.4	11.4	0	11.4	11.4	0		
1ASOC001.66	115	9.742	9.8	2.56824	26.36%	5.2	15.25	10.05	7.8	11.6	3.8	0.532737	-1.81501
1ASOC007.06	83	9.86301	8.71	3.52899	35.78%	5.5	17.3	11.8	7.05	13.6	6.55	2.21583	-1.60302
1ASOC010.09	7	13.0714	12.3	1.31747	10.08%	12.3	15	2.7	12.3	15	2.7	1.32816	-0.453652
1ASOC012.38	66	10.7932	11	3.40435	31.54%	6.02	17.6	11.58	7.87	13.5	5.63	0.975961	-1.38287
1ASOR002.99	24	8.555	8.245	1.6	0.187025	6.7	11.03	4.33	7.39	9.72	2.33	1.20443	-0.8805
1ASUG004.42	182	9.69791	9.21	2.33575	24.09%	6	15.67	9.67	7.79	11.2	3.41	3.59401	-0.770989
1ASYC002.03	154	9.82818	9.82	2.38E+00	2.42E-01	5.94	14.2	8.26	7.63	11.79	4.16	0.210403	-3.13827
1ASYC004.93	60	9.515	8.66	3.2934	34.61%	5.3	15.6	10.3	6.635	12.3	5.665	1.5295	-1.71879

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1ASYC007.43	70	10.4379	9.8	3.14778	0.301573	6.17	16.6	10.43	7.7	12.8	5.1	1.60179	-1.73906
1ATUS000.04	23	10.3335	10.2	2.36139	22.85%	6.55	13.83	7.28	9.06	13.34	4.28	1.76E-01	-0.838689
1ATUS000.37	160	10.4499	10.55	2.77258	26.53%	5.1	15.8	10.7	7.98	12.84	4.86	0.0737901	-2.84618
1AWAC003.31	6	8.4	8.4	0	0.00%	8.4	8.4	0	8.4	8.4	0		
1AXAQ000.85	24	10.91	11.005	1.62825	14.92%	8.53	12.9	4.37	9.42	12.5	3.08	-0.572066	-1.38473
1AXCO000.39	4	7.95	7.95	0.404145	5.08%	7.6	8.3	0.7	7.6	8.3	0.7	0	-2.44949
1AXCO000.92	4	9.25	9.25	0.519615	5.62%	8.8	9.7	0.9	8.8	9.7	0.9	0	-2.44949
1AXCO000.96	4	9.95	9.95	0.057735	0.58%	9.9	10	0.1	9.9	10	0.1	7.5438E-14	-2.44949
1AXDI000.01	4	8.25	8.25	0.057735	0.70%	8.2	8.3	0.1	8.2	8.3	0.1	0	-2.44949
1AXGJ000.42	15	8.76	7.8	2.92375	33.38%	6.1	14	7.9	6.7	9.2	2.5	1.80689	-0.0449087
1AXGU000.18	8	9.6	9.9	0.555492	5.79%	8.7	9.9	1.2	9.3	9.9	0.6	-1.66296	-4.6151E-15
1AXJT002.22	26	9.41577	9.01	2.54599	27.04%	6.38	13.78	7.4	7.64	9.6	1.96	1.52351	-0.745306
1AXKR000.77	6	9.77	9.77	1.95E-15	0.00%	9.77	9.77	0	9.77	9.77	0	1.36931	-1.66667
1AXLE001.62	7	12.0857	11.1	2.94133	24.34%	6.9	14.8	7.9	11.1	14.8	3.7	-0.815454	0.0765587

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DO (Winkler) mg/L	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABEC004.76	36	8.89	8.7	2.24584	25.26%	3.6	13.29	9.69	7.45	10.6	3.15	-0.479628	-0.076006
1ABIR000.76	43	8.94186	8.8	2.31517	25.89%	3.8	13.59	9.79	7.7	10.2	2.5	-0.42311	0.042282
1ABIR005.21	2	9.4	9.4	0.424264	4.51%	9.1	9.7	0.6	9.1	9.7	0.6		
1ABLR000.10	1	12.6	12.6		%	12.6	12.6	0	12.6	12.6	0		
1ABRB002.15	191	9.40414	9.1	2.81534	29.94%	0	15.19	15.19	7.2	11.8	4.6	-0.465467	-1.51107
1ABRB015.04	1	7.8	7.8		%	7.8	7.8	0	7.8	7.8	0		
1ABRB015.38	2	9.15	9.15	0.212132	2.32%	9	9.3	0.3	9	9.3	0.3		
1ABUL025.94	17	9.93353	10	1.58089	0.159146	7.6	13.1	5.5	8.5	11.3	2.8	0.301711	-0.608356
1ABUT000.69	1	12	12		%	12	12	0	12	12	0		
1ACAA003.46	1	13	13		%	13	13	0	13	13	0		
1ACAA008.01	1	14.1	14.1		%	14.1	14.1	0	14.1	14.1	0		
1ACAX000.19	53	10.6277	10.5	1.81624	17.09%	7.8	14.19	6.39	9.2	12.39	3.19	0.61464	-1.53047
1ACAX004.57	148	10.6284	10.45	2.26313	0.212933	0.5	16.4	15.9	8.85	12.25	3.4	-1.70071	3.72103
1ACAX008.61	1	13.3	13.3		%	13.3	13.3	0	13.3	13.3	0		
1ACRM001.20	3	10.1	10.4	2.86182	28.33%	7.1	12.8	5.7	7.1	12.8	5.7	-0.329897	
1ACRM005.39	1	7.9	7.9		%	7.9	7.9	0	7.9	7.9	0		
1ACRM008.59	1	8	8		%	8	8	0	8	8	0		
1ACUB003.74	55	8.63745	9.1	2.93665	34.00%	3	13.69	10.69	6.2	11.1	4.9	-0.622428	-1.56703
1ACUB008.60	7	7.92857	6.9	1.75757	22.17%	6.9	10.6	3.7	6.9	10.4	3.5	1.33317	-0.438001
1ADRL001.00	1	11.8	11.8		%	11.8	11.8	0	11.8	11.8	0		
1ADUT000.62	40	10.7943	10.49	1.91571	17.75%	8	14.29	6.29	9.2	12.29	3.09	1.01395	-1.50553
1ADUT002.72	1	8.7	8.7		%	8.7	8.7	0	8.7	8.7	0		
1AELC001.39	6	8.6	8.6	0	0.00%	8.6	8.6	0	8.6	8.6	0		
1AFLB000.64	22	9.17091	8.9	2.99514	32.66%	4.6	17.8	13.2	7	10.8	3.8	1.96273	1.87191
1AFLB001.40	25	9.158	9.1	2.25838	0.246602	4.8	13.5	8.7	7.6	11.2	3.6	0.0802894	-0.897685
1AFLB002.53	2	10.3	10.3	0.707107	0.068651	9.8	10.8	1	9.8	10.8	1		
1AFOL000.53	4	7	6.1	3.84621	54.95%	3.5	12.3	8.8	4.25	9.75	5.5	0.937636	0.427814
1AFOL001.52	1	7.6	7.6		%	7.6	7.6	0	7.6	7.6	0		
1AFRY000.60	1	12	12		%	12	12	0	12	12	0		
1AGOO002.38	185	10.206	10.19	2.26652	22.21%	5.6	15.8	10.2	8.3	11.9	3.6	0.641205	-2.56843
1AGOO004.89	5	7	6.9	0.4	5.71%	6.5	7.5	1	6.8	7.3	0.5	0.106977	-0.647211
1AGOO011.23	134	10.2001	10.1	2.06663	20.26%	5.6	15.2	9.6	8.5	12	3.5	1.38587	-1.77849
1AGOO014.44	55	10.1531	9.8	2.26361	22.29%	6.4	14.79	8.39	8.4	12.39	3.99	1.16861	-1.70116
1AGOO022.44	175	10.688	10.2	5.27403	0.493454	4.8	73.5	68.7	8.6	12.2	3.6	52.8358	315.161
1AGOO030.75	84	10.3336	9.95	2.02233	19.57%	7	15.59	8.59	8.45	12	3.55	1.5947	-1.50809
1AGOO044.36	71	10.3392	10.1	2.02375	0.195736	5.1	14.5	9.4	8.8	11.79	2.99	1.10044	-0.627382
1AHPR000.32	1	12.6	12.6		%	12.6	12.6	0	12.6	12.6	0		
1AHPR002.28	9	10.8622	11.39	2.5264	23.26%	6.8	15.19	8.39	9.2	12.39	3.19	0.164512	-0.086365

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1AHP003.87	142	10.3035	10.395	2.45483	23.83%	5	15.19	10.19	8.6	12.2	3.6	-0.516576	-2.08285
1AHP004.91	2	12.6	12.6	0.282843	2.24%	12.4	12.8	0.4	12.4	12.8	0.4		
1AHP006.51	1	12.8	12.8		%	12.8	12.8	0	12.8	12.8	0		
1AINI000.80	1	13.2	13.2		%	13.2	13.2	0	13.2	13.2	0		
1AJEE002.22	1	13.3	13.3		%	13.3	13.3	0	13.3	13.3	0		
1AJEE004.84	1	12.7	12.7		%	12.7	12.7	0	12.7	12.7	0		
1ALII003.97	21	10.05	10.29	1.81463	0.180561	6.1	13.5	7.4	8.8	11	2.2	0.0383014	0.19992
1ALIM001.16	25	10.8764	10.59	2.08755	19.19%	7.4	14.19	6.79	9.1	12.39	3.29	0.132404	-1.27295
1ALIV004.78	9	11.0378	11.59	1.58807	14.39%	7.1	12.5	5.4	11.59	11.59	0	-2.82644	3.54632
1ALIV005.76	15	9.358	9.2	2.1144	22.59%	5.4	13.59	8.19	8	10.19	2.19	0.721787	0.40654
1ALIV006.92	3	5.36	5.36	0	0.00%	5.36	5.36	0	5.36	5.36	0		
1ALIV012.12	1	12.2	12.2		%	12.2	12.2	0	12.2	12.2	0		
1ALIV016.50	1	11.6	11.6		%	11.6	11.6	0	11.6	11.6	0		
1ALIV018.08	1	11.6	11.6		%	11.6	11.6	0	11.6	11.6	0		
1ALNR001.04	2	8.3	8.3	0	0.00%	8.3	8.3	0	8.3	8.3	0		
1ANOC000.42	77	10.9805	11.4	1.84498	16.80%	5	15.5	10.5	9.6	12	2.4	-1.61798	1.126
1ANOC004.38	44	10.467	10.645	2.00439	19.15%	7.3	14.29	6.99	8.65	12.045	3.395	0.233971	-1.44492
1ANOC007.28	1	9.5	9.5		%	9.5	9.5	0	9.5	9.5	0		
1ANOC009.13	1	9.6	9.6		%	9.6	9.6	0	9.6	9.6	0		
1ANOC009.37	2	8.43	8.43	0	0	8.43	8.43	0	8.43	8.43	0		
1ANOC011.74	1	8.6	8.6		%	8.6	8.6	0	8.6	8.6	0		
1ANOG005.69	181	10.7591	10.9	2.16225	20.10%	0	15.2	15.2	9.1	12.4	3.3	-3.85844	5.70809
1ANOG011.60	5	9.96	10.2	1.61338	16.20%	8.1	12	3.9	8.6	10.9	2.3	0.0347573	-0.831199
1APAE004.21	6	8.94	8.94	1.09545	12.25%	7.94	9.94	2	7.94	9.94	2	1.8243E-15	-1.66667
1APIA000.18	1	8.4	8.4		%	8.4	8.4	0	8.4	8.4	0		
1APIA001.80	8	9.1375	8.6	1.4362	15.72%	7.7	12.3	4.6	8.6	9.35	0.75	2.13632	2.08284
1APIA004.67	1	7.7	7.7		%	7.7	7.7	0	7.7	7.7	0		
1APIA007.08	1	7.4	7.4		%	7.4	7.4	0	7.4	7.4	0		
1APOT170.40	107	10.735	10.5	2.27906	21.23%	0	16.09	16.09	9.4	12.19	2.79	-3.02313	7.63701
1ASFS000.28	1	12.5	12.5		%	12.5	12.5	0	12.5	12.5	0		
1ASOC001.66	125	10.6347	11	2.23964	21.06%	0.2	16.3	16.1	8.9	12	3.1	-3.63007	6.36048
1ASOC005.46	3	9.7	9.1	2.65141	27.33%	7.4	12.6	5.2	7.4	12.6	5.2	0.68319	
1ASOC007.06	1	8	8		%	8	8	0	8	8	0		
1ASOC008.46	2	11.4	11.4	1.69706	14.89%	10.2	12.6	2.4	10.2	12.6	2.4		
1ASOC011.82	64	10.5903	10.74	1.8464	17.43%	6	14	8	9.25	12.14	2.89	-1.4011	-0.694418
1ASOC012.38	43	10.746	10.5	1.96327	18.27%	7.5	17.59	10.09	9.2	12.5	3.3	2.25494	2.41303
1ASOC014.58	4	10.05	10.1	2.12525	21.15%	7.4	12.6	5.2	8.7	11.4	2.7	-0.114832	0.598849
1ASOC015.92	2	11.3	11.3	1.55563	0.137667	10.2	12.4	2.2	10.2	12.4	2.2		

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1ASOR000.59	2	8.3	8.3	0.141421	1.70%	8.2	8.4	0.2	8.2	8.4	0.2		
1ASOR002.99	6	8.16	8.16	1.95E-15	2.38E-16	8.16	8.16	0	8.16	8.16	0	1.36931	-1.66667
1ASUG000.05	2	7.5	7.5	0.424264	0.056569	7.2	7.8	0.6	7.2	7.8	0.6		
1ASUG004.42	175	9.97571	9.7	2.37528	23.81%	5.1	15.2	10.1	8	11.8	3.8	0.723638	-2.86716
1ASUG008.46	29	9.88	9	2.90516	29.40%	5.6	16.79	11.19	7.6	11.79	4.19	1.34619	-0.500136
1ASUG009.07	2	10.8	10.8	0.282843	2.62%	10.6	11	0.4	10.6	11	0.4		
1ASYC002.03	3	11.5333	11.1	9.29E-01	8.06E-02	10.9	12.6	1.7	10.9	12.6	1.7	1.16122	
1ASYC006.23	1	15	15		%	15	15	0	15	15	0		
1ASYC007.43	1	12.8	12.8		%	12.8	12.8	0	12.8	12.8	0		
1ASYC009.78	1	13	13		%	13	13	0	13	13	0		
1ATOW000.60	1	12	12		%	12	12	0	12	12	0		
1ATUS000.37	228	9.78294	9.8	2.44209	24.96%	4.6	15.9	11.3	7.85	11.8	3.95	1.30023	-1.95062
1ATUS003.19	82	10.1107	10	2.89811	28.66%	2	17.59	15.59	9	12.19	3.19	-2.55822	2.54481
1AXAC000.09	3	9.23333	9.6	2.66896	28.91%	6.4	11.7	5.3	6.4	11.7	5.3	-0.428896	
1AXBL000.28	1	7.8	7.8		%	7.8	7.8	0	7.8	7.8	0		
1AXCO000.39	2	10.15	10.15	1.76777	17.42%	8.9	11.4	2.5	8.9	11.4	2.5		
1AXGB000.07	2	9.3	9.3	1.83848	19.77%	8	10.6	2.6	8	10.6	2.6		

Section B) Monthly averages for several field and lab analytes including Total Suspended Solids, DO (probe), Total Phosphorous, Total Nitrogen, Turbidity, and Temperature

Summary Statistics; Data from selected analytes by month for period of record.

Summary Statistics

Data variable: Turbidity (NTU)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	62	26.8177	9.4	66.6136	1.8	453.0	451.2	16.122	46.1071
Feb	78	13.8145	6.25	18.1987	1.1	94.2	93.1	9.51865	12.9017
Mar	80	9.678	5.835	10.6297	2.33	55.0	52.67	9.4822	12.1689
April	72	8.365	6.31	8.19578	1.9	54.0	52.1	11.1479	23.6865
May	94	10.365	6.865	12.245	1.6	93.0	91.4	16.5449	45.6229
June	59	10.1758	9.8	6.29478	1.61	26.0	24.39	2.50882	-0.126304
July	90	15.0004	7.22	29.7136	0.98	208.5	207.52	18.4375	49.2327
Aug	64	13.9981	6.725	24.4384	2.87	155.0	152.13	14.2756	33.8485
Sept	67	39.85	7.01	187.582	1.4	1540.0	1538.6	26.6857	108.164
Oct	56	7.98232	3.245	31.0025	1.0	235.0	234.0	22.6043	84.2153
Nov	76	6.27566	4.14	8.68141	1.26	66.0	64.74	18.1304	55.5674
Dec	69	8.34551	4.63	10.093	0.83	49.0	48.17	8.18447	9.22178
Total	867	13.9644	6.1	57.8664	0.83	1540.0	1539.17	264.399	3389.93

Summary Statistics

Data variable: Total Suspended Solids (mg/L)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	163	165.135	127.0	102.942	66.0	640.0	574.0	11.234	12.8761
Feb	151	149.94	112.0	95.5285	0.0	642.0	642.0	12.0255	16.9022
Mar	182	143.546	112.0	125.555	20.39	1187.0	1166.61	28.9654	96.8586
April	229	137.966	118.0	63.2187	22.29	379.0	356.71	8.55334	5.56461
May	209	143.311	119.0	64.8356	11.0	418.0	407.0	8.1628	5.97226
June	173	149.786	131.0	55.7896	71.0	344.0	273.0	6.25358	2.61862
July	203	163.222	142.0	79.7596	64.0	633.0	569.0	13.9378	25.1566
Aug	184	173.978	138.0	165.402	21.0	2097.0	2076.0	49.3757	278.883
Sept	147	169.517	134.0	187.077	38.0	2167.0	2129.0	42.9954	223.758
Oct	157	159.134	139.0	65.8691	78.0	425.0	347.0	8.36385	8.32367
Nov	166	145.988	126.5	65.5837	68.0	445.0	377.0	10.7425	14.4161
Dec	137	142.234	123.0	70.306	32.0	549.0	517.0	12.5201	24.2397
Total	2101	153.218	127.0	102.369	0.0	2167.0	2167.0	159.905	1316.31

Summary Statistics

Data variable: Dissolved Oxygen (mg/L)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	309	12.66	12.7	1.29515	9.09	16.73	7.64	0.28802	1.63184
Feb	300	12.9669	13.14	1.13911	9.92	15.5	5.58	-2.61752	-1.92205
Mar	572	12.0305	12.0	1.4962	8.0	17.4	9.4	-1.30597	-0.631311
April	598	10.8178	10.88	1.37419	6.2	16.6	10.4	2.86605	4.27342
May	630	9.27756	9.16	1.26216	6.0	13.66	7.66	2.20485	1.30646
June	571	8.04305	8.0	1.21425	3.2	11.9	8.7	1.17997	1.5938
July	605	7.31565	7.37	1.176	4.58	11.3	6.72	3.67866	-0.730233
Aug	323	7.40146	7.41	1.23608	3.9	11.2	7.3	2.41506	1.22318
Sept	471	7.67966	7.8	1.41608	5.07	12.38	7.31	2.40215	-0.224485
Oct	362	9.58793	9.9	1.58914	3.13	13.5	10.37	-6.97853	4.47855
Nov	431	11.1819	11.4	1.89395	5.82	14.4	8.58	-6.90272	0.715359
Dec	288	12.1636	11.8	1.71455	7.98	18.1	10.12	2.63556	2.92716
Total	5460	9.8566	9.82	2.41344	3.13	18.1	14.97	4.0349	-11.7663

Summary Statistics

Data variable: Total Phosphorous (mg/L)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	194	0.0997938	0.05	0.109104	0.01	1.1	1.09	27.7654	106.093
Feb	188	0.116436	0.05	0.210482	0.005	1.5	1.495	27.1852	71.1491
Mar	231	0.0772727	0.05	0.238464	0.01	3.6	3.59	87.8783	650.023
April	234	0.0735897	0.05	0.0696892	0.01	0.52	0.51	25.2664	66.0178
May	228	0.0807675	0.05	0.0671966	0.005	0.5	0.495	17.4659	33.6956
June	206	0.100534	0.09	0.0793523	0.02	0.5	0.48	14.3682	21.7285
July	251	0.110956	0.06	0.186954	0.01	1.8	1.79	41.9707	155.391
Aug	182	0.101731	0.1	0.0915846	0.005	0.6	0.595	19.0195	39.7738
Sept	192	0.12276	0.07	0.187916	0.01	2.0	1.99	36.7962	158.243
Oct	204	0.108382	0.05	0.139718	0.01	1.3	1.29	25.6843	82.0246
Nov	202	0.0802376	0.05	0.145663	0.005	1.99	1.985	66.2033	430.98
Dec	170	0.0720882	0.05	0.0627517	0.005	0.4	0.395	12.7445	18.4339
Total	2482	0.0950657	0.05	0.147142	0.005	3.6	3.595	215.094	1803.34

Summary Statistics

Data variable: Total Nitrogen (mg/L)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	26	1.68577	1.625	0.526621	0.91	3.01	2.1	1.8044	0.366031
Feb	9	1.30111	1.44	0.441968	0.68	1.77	1.09	-0.607763	-0.95452
Mar	31	1.27839	1.26	0.346267	0.7	1.99	1.29	0.783583	-0.423835
April	16	0.9175	0.885	0.492131	0.22	1.82	1.6	0.5669	-0.67017
May	20	1.1535	1.15	0.390415	0.67	2.0	1.33	1.40111	-0.0555273
June	20	1.1595	1.13	0.394641	0.6	2.14	1.54	1.19924	0.373354
July	30	1.21633	1.165	0.406766	0.48	2.54	2.06	2.45273	3.03506
Aug	18	1.00556	0.915	0.585704	0.54	3.21	2.67	5.95968	11.5163
Sept	27	1.14185	0.88	0.600609	0.6	2.83	2.23	2.69458	0.95867
Oct	19	1.12737	1.22	0.37868	0.36	1.59	1.23	-1.78363	0.103699
Nov	20	1.3015	1.245	0.496973	0.51	2.13	1.62	0.305579	-1.05816
Dec	19	1.29632	1.27	0.494404	0.63	2.28	1.65	0.453245	-0.726405
Total	255	1.22984	1.18	0.494337	0.22	3.21	2.99	5.56736	4.08905

Summary Statistics

Data variable: Temperature (oC)

				Standard				Standardized	Standardized
Month	Count	Average	Median	Deviation	Minimum	Maximum	Range	Skewness	Kurtosis
Jan	363	3.12975	2.5	2.84322	-0.06	23.0	23.06	11.7472	22.3381
Feb	305	3.6098	2.94	2.93885	-0.08	13.89	13.97	8.58085	3.74367
Mar	424	6.7225	7.0	2.95397	0.0	17.0	17.0	1.17256	-0.491924
April	459	12.1564	12.0	3.71932	4.44	25.56	21.12	3.90501	2.18579
May	486	17.0981	17.1	3.45998	1.0	32.0	31.0	0.975957	7.48408
June	436	21.3741	21.6	3.15545	9.0	31.0	22.0	-1.46105	0.4839
July	483	23.7072	23.82	2.55646	2.0	30.2	28.2	-15.6305	56.041
Aug	370	23.0322	23.365	3.58646	1.9	29.5	27.6	-23.9905	62.4793
Sept	388	19.2823	19.78	4.1905	1.8	27.22	25.42	-17.394	29.7027
Oct	379	12.8436	12.78	3.54625	1.0	20.0	19.0	-6.97811	6.8192
Nov	377	8.24032	8.0	3.30742	0.3	17.78	17.48	0.29229	-0.962849
Dec	345	4.04971	3.89	2.52245	-0.08	12.29	12.37	3.01863	-2.05273
Total	4815	13.5247	13.5	8.05414	-0.08	32.0	32.08	-0.607585	-17.9235

Summary Statistics Monthly averages and medians

Data variable: TSS (mg/L)

<i>Collection_Date_Time_I</i>	<i>Count</i>	<i>Average</i>	<i>Median</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Standardized</i>
12/68	5	156.8	187.0	96.0	209.0	-0.465324
5/69	5	178.2	193.0	106.0	260.0	0.0123768
8/69	5	114.2	130.0	21.0	196.0	-0.227062
3/70	6	245.232	138.5	20.39	895.0	2.31037
4/70	6	139.882	155.5	22.29	211.0	-1.46304
5/70	6	199.5	204.5	129.0	266.0	-0.150859
1/75	1	86.0	86.0	86.0	86.0	
2/75	8	129.5	107.0	72.0	304.0	2.64586
3/75	9	264.0	134.0	94.0	1187.0	3.50423
4/75	7	114.571	103.0	57.0	218.0	1.52263
5/75	7	173.571	154.0	92.0	346.0	1.87165
6/75	10	167.1	154.5	85.0	294.0	0.601293
7/75	4	281.5	187.5	118.0	633.0	1.49324
8/75	2	172.5	172.5	170.0	175.0	
10/75	4	142.25	146.0	102.0	175.0	-0.437607
12/75	4	88.5	88.0	83.0	95.0	0.372468
3/76	4	125.25	121.0	115.0	144.0	1.05668
5/76	4	218.0	210.0	188.0	264.0	1.02598
6/76	5	192.6	200.0	106.0	315.0	0.560085
7/76	4	287.0	227.5	146.0	547.0	1.3771
8/76	9	160.222	166.0	54.0	280.0	0.300968
9/76	5	350.6	275.0	215.0	735.0	1.96397
11/76	7	198.857	200.0	148.0	234.0	-0.907599
2/77	3	184.0	174.0	146.0	232.0	0.687725
4/77	2	295.0	295.0	272.0	318.0	
5/77	4	257.75	257.0	192.0	325.0	0.00785612
4/78	2	115.0	115.0	84.0	146.0	
5/78	2	140.0	140.0	115.0	165.0	
6/78	3	128.0	111.0	83.0	190.0	0.883357
7/78	2	270.0	270.0	140.0	400.0	
8/78	2	319.0	319.0	141.0	497.0	
9/78	4	201.0	198.5	77.0	330.0	0.00344488
10/78	3	238.333	210.0	80.0	425.0	0.503753
11/78	2	272.0	272.0	115.0	429.0	
12/78	3	135.333	156.0	77.0	173.0	-1.07476
1/79	2	292.5	292.5	214.0	371.0	
3/79	4	128.25	113.5	80.0	206.0	0.914197
4/79	3	122.667	101.0	83.0	184.0	1.07273
5/79	2	122.0	122.0	11.0	233.0	
6/79	4	143.5	132.0	97.0	213.0	0.924213
7/79	14	148.571	135.5	97.0	332.0	3.97784
8/79	23	235.522	127.0	74.0	2097.0	8.96302
9/79	3	135.333	125.0	124.0	157.0	1.22084
10/79	10	131.6	111.0	78.0	212.0	0.949987
11/79	5	124.2	129.0	71.0	170.0	-0.303321
12/81	1	150.0	150.0	150.0	150.0	
10/82	4	217.0	224.5	167.0	252.0	-0.34152
4/83	3	187.0	204.0	145.0	212.0	-1.15922
3/85	2	135.5	135.5	113.0	158.0	
5/85	1	153.0	153.0	153.0	153.0	
6/85	1	149.0	149.0	149.0	149.0	
7/85	2	156.5	156.5	132.0	181.0	
8/85	2	257.5	257.5	113.0	402.0	
11/85	2	159.5	159.5	141.0	178.0	
12/85	1	171.0	171.0	171.0	171.0	

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1/86	2	111.0	111.0	102.0	120.0	
2/86	1	108.0	108.0	108.0	108.0	
4/86	2	143.0	143.0	115.0	171.0	
5/86	2	169.0	169.0	148.0	190.0	
6/86	1	198.0	198.0	198.0	198.0	
7/86	2	170.5	170.5	148.0	193.0	
8/86	1	193.0	193.0	193.0	193.0	
9/86	2	106.5	106.5	80.0	133.0	
10/86	1	176.0	176.0	176.0	176.0	
11/88	8	182.25	173.5	68.0	342.0	0.758663
12/88	5	173.8	168.0	32.0	316.0	0.00960785
1/89	7	177.857	165.0	112.0	265.0	0.469535
2/89	7	179.857	185.0	103.0	285.0	0.298898
3/89	9	188.667	222.0	60.0	328.0	0.017362
4/89	8	154.75	158.0	76.0	251.0	0.430822
5/89	8	218.875	199.5	81.0	418.0	0.786422
6/89	8	164.125	157.0	101.0	325.0	2.2269
7/89	7	154.429	168.0	76.0	292.0	1.2176
8/89	6	165.5	143.5	90.0	309.0	1.31595
9/89	7	201.857	230.0	85.0	391.0	0.61226
10/89	3	217.333	217.0	94.0	341.0	0.00858826
11/89	7	163.429	158.0	77.0	328.0	1.35841
12/89	6	244.833	182.0	87.0	549.0	1.20007
1/90	7	219.286	186.0	99.0	389.0	0.453429
2/90	7	152.857	138.0	72.0	298.0	1.20992
3/90	5	141.6	102.0	91.0	242.0	1.07703
4/90	5	218.4	222.0	86.0	340.0	-0.266252
5/90	7	175.286	168.0	90.0	326.0	0.899777
6/90	7	171.714	167.0	100.0	277.0	0.908473
7/90	7	186.286	127.0	95.0	402.0	1.54331
8/90	9	140.778	125.0	57.0	255.0	0.853931
9/90	13	178.231	135.0	100.0	500.0	3.08047
10/90	9	109.889	106.0	88.0	144.0	1.17985
11/90	4	96.0	96.5	81.0	110.0	-0.0521631
12/90	3	96.3333	96.0	90.0	103.0	0.16259
1/91	18	168.556	112.0	66.0	640.0	4.28413
2/91	4	97.5	99.5	80.0	111.0	-0.289024
3/91	4	92.0	93.5	74.0	107.0	-0.19151
4/91	13	114.769	108.0	80.0	207.0	2.4232
5/91	9	100.667	95.0	80.0	135.0	1.48382
6/91	5	114.8	107.0	86.0	156.0	0.540801
7/91	12	151.5	127.5	96.0	316.0	2.44185
8/91	5	217.4	205.0	106.0	400.0	0.849157
9/91	4	198.75	197.0	100.0	301.0	0.104279
10/91	8	200.375	192.0	136.0	278.0	0.390693
11/91	10	165.1	134.0	86.0	412.0	3.31369
12/91	5	137.4	136.0	112.0	162.0	-0.0758339
1/92	17	141.353	132.0	76.0	247.0	1.68939
2/92	10	116.0	106.0	79.0	181.0	1.64147
3/92	5	110.6	103.0	86.0	167.0	1.6869
4/92	19	119.842	106.0	77.0	190.0	1.55951
5/92	4	108.0	107.5	33.0	184.0	0.0371049
6/92	5	105.4	100.0	76.0	155.0	1.28322
7/92	14	157.571	134.5	93.0	334.0	2.44435
8/92	10	113.0	108.0	70.0	170.0	1.07652
9/92	5	124.4	107.0	90.0	186.0	0.888921
10/92	14	168.5	144.5	105.0	358.0	3.21873
11/92	10	117.3	110.0	86.0	164.0	1.0289
12/92	5	93.8	84.0	57.0	152.0	1.14625
1/93	17	144.765	125.0	82.0	415.0	4.71475
2/93	5	97.4	86.0	82.0	134.0	1.52701

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3/93	5	99.0	77.0	71.0	168.0	1.46022
4/93	14	117.571	101.0	72.0	184.0	1.07468
5/93	9	118.778	114.0	76.0	185.0	0.974859
6/93	5	96.4	84.0	71.0	162.0	1.88527
7/93	11	149.273	142.0	67.0	364.0	2.59106
8/93	12	153.25	114.5	76.0	376.0	2.39781
9/93	9	130.333	133.0	94.0	189.0	0.952744
10/93	16	160.563	136.0	94.0	391.0	3.6974
11/93	13	131.077	126.0	72.0	205.0	0.705306
1/94	11	181.455	185.0	97.0	321.0	0.7035
2/94	5	69.0	86.0	0.0	95.0	-1.89176
3/94	10	95.8	96.5	61.0	155.0	1.38188
4/94	13	117.692	103.0	72.0	200.0	1.09812
5/94	10	101.9	93.0	70.0	184.0	2.75963
6/94	6	148.167	125.0	91.0	246.0	0.906275
7/94	11	163.636	128.0	91.0	338.0	2.21693
8/94	8	126.25	117.0	102.0	170.0	0.921657
9/94	4	139.75	124.5	103.0	207.0	1.38419
10/94	13	162.462	146.0	98.0	412.0	3.58516
11/94	10	128.7	125.5	77.0	220.0	1.01272
12/94	5	118.6	113.0	85.0	184.0	1.26821
1/95	13	134.846	121.0	90.0	213.0	1.04165
2/95	9	106.778	97.0	84.0	179.0	2.48609
3/95	5	134.4	120.0	95.0	208.0	1.43867
4/95	13	138.769	128.0	80.0	220.0	0.623719
5/95	11	117.182	112.0	71.0	216.0	2.33064
6/95	4	135.75	126.0	97.0	194.0	0.949633
7/95	13	148.538	141.0	77.0	222.0	0.584651
8/95	12	129.25	110.0	81.0	218.0	1.51484
9/95	7	137.571	115.0	91.0	266.0	2.03688
10/95	12	157.583	140.0	92.0	248.0	0.94816
11/95	5	92.6	80.0	76.0	124.0	1.03222
12/95	5	112.4	97.0	79.0	176.0	1.2675
1/96	6	128.833	94.5	77.0	255.0	1.4984
2/96	11	165.636	103.0	78.0	451.0	2.35124
3/96	10	89.9	95.0	56.0	116.0	-0.802391
4/96	13	133.077	116.0	72.0	216.0	0.840155
5/96	9	109.778	112.0	87.0	137.0	0.454136
6/96	5	134.2	122.0	93.0	212.0	1.59965
7/96	13	149.077	143.0	89.0	220.0	0.60133
8/96	11	205.091	133.0	106.0	600.0	3.00276
9/96	6	118.0	102.5	82.0	165.0	0.758747
10/96	3	131.667	100.0	99.0	196.0	1.2243
11/96	11	131.091	123.0	77.0	198.0	0.704737
12/96	10	122.3	124.5	84.0	162.0	0.131568
1/97	5	118.2	106.0	84.0	187.0	1.56838
2/97	12	165.583	107.5	82.0	400.0	1.89252
3/97	11	108.455	108.0	63.0	197.0	2.18587
4/97	5	112.0	100.0	83.0	184.0	1.80924
5/97	14	151.571	128.5	82.0	250.0	0.735207
6/97	11	131.909	119.0	89.0	220.0	2.15887
7/97	5	159.4	138.0	122.0	256.0	1.83833
8/97	10	182.5	157.0	115.0	293.0	0.904828
9/97	13	123.615	112.0	80.0	218.0	1.61417
10/97	7	132.571	102.0	77.0	215.0	0.767807
11/97	7	125.0	116.0	90.0	181.0	1.01298
12/97	17	130.647	109.0	71.0	234.0	1.43627
1/98	5	139.6	117.0	96.0	242.0	1.83124
2/98	14	117.714	110.0	71.0	163.0	0.389629
3/98	10	94.3	83.0	62.0	151.0	1.49504
4/98	5	99.6	90.0	79.0	146.0	1.74443

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5/98	8	135.0	125.5	80.0	221.0	0.667224
6/98	11	117.455	103.0	82.0	207.0	2.046
7/98	11	128.091	123.0	77.0	207.0	1.24854
8/98	17	154.882	143.0	73.0	258.0	0.885034
10/98	5	160.6	122.0	117.0	224.0	0.553998
11/98	7	177.714	181.0	118.0	250.0	0.244184
12/98	11	147.727	133.0	104.0	245.0	1.32953
1/99	10	137.8	124.0	79.0	331.0	3.3001
2/99	14	179.143	163.0	92.0	410.0	2.4873
3/99	11	115.818	112.0	76.0	210.0	2.13925
4/99	14	182.929	146.5	93.0	307.0	0.943039
5/99	11	133.364	112.0	81.0	248.0	1.86848
6/99	5	157.2	117.0	103.0	233.0	0.530324
7/99	21	217.476	182.0	120.0	429.0	1.90567
8/99	9	224.889	151.0	118.0	557.0	2.39201
9/99	20	272.45	161.5	110.0	2167.0	8.04701
10/99	6	113.667	109.5	88.0	154.0	0.581729
11/99	20	149.25	122.0	78.0	445.0	4.88809
12/99	18	125.667	118.5	88.0	233.0	3.29024
1/00	12	113.333	104.5	82.0	207.0	2.75833
2/00	7	162.0	106.0	87.0	464.0	2.63907
3/00	26	146.077	99.5	60.0	749.0	8.09238
4/00	12	97.75	110.0	47.0	171.0	0.398014
5/00	27	131.519	118.0	66.0	345.0	4.31132
6/00	13	145.538	122.0	100.0	304.0	3.30414
7/00	25	127.52	120.0	64.0	217.0	0.824584
8/00	12	192.667	175.0	154.0	264.0	1.65408
9/00	20	104.65	92.0	38.0	228.0	1.82171
10/00	5	146.8	126.0	117.0	238.0	1.98992
11/00	15	144.267	117.0	81.0	296.0	2.5443
12/00	9	168.0	140.0	122.0	271.0	1.72616
1/01	14	272.929	223.5	117.0	560.0	1.00791
2/01	5	155.2	108.0	87.0	366.0	1.99874
3/01	13	172.462	137.0	76.0	448.0	2.32265
4/01	11	131.545	121.0	82.0	221.0	1.59145
5/01	15	157.467	120.0	71.0	308.0	1.48628
6/01	11	151.364	123.0	102.0	256.0	1.44244
8/01	9	180.667	146.0	138.0	257.0	0.98638
9/01	15	157.733	151.0	86.0	259.0	0.824001
10/01	20	173.8	150.5	90.0	344.0	1.89946
11/01	13	139.154	126.0	80.0	284.0	2.81747
12/01	17	159.941	140.0	82.0	354.0	2.4587
1/02	11	160.0	122.0	79.0	501.0	3.92343
2/02	16	201.5	143.0	74.0	505.0	1.99346
3/02	11	136.091	129.0	94.0	224.0	2.09058
4/02	20	160.15	131.0	84.0	334.0	2.33186
5/02	22	136.091	131.5	91.0	227.0	1.9582
6/02	20	154.9	149.5	107.0	249.0	1.7855
7/02	13	158.923	153.0	115.0	275.0	2.26683
10/02	4	139.0	137.0	89.0	193.0	0.219607
2/03	4	253.0	143.0	84.0	642.0	1.5688
3/03	16	142.938	120.0	82.0	310.0	3.15246
4/03	22	135.545	117.5	68.0	270.0	2.48727
6/03	21	163.619	146.0	87.0	344.0	3.17056
7/03	4	161.5	173.0	83.0	217.0	-0.321966
8/03	8	131.625	116.0	107.0	232.0	3.09995
9/03	5	158.2	169.0	96.0	219.0	-0.0965921
10/03	8	133.75	121.5	93.0	245.0	2.80492
11/03	5	144.6	142.0	80.0	198.0	-0.152772
12/03	8	133.375	109.5	98.0	269.0	2.80631
1/04	5	243.2	147.0	70.0	476.0	0.51748

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2/04	6	117.833	115.5	103.0	136.0	0.296862
3/04	5	192.0	129.0	75.0	328.0	0.454514
4/04	8	147.75	117.0	99.0	273.0	1.64281
5/04	5	112.2	113.0	72.0	144.0	-0.694186
6/04	9	156.778	139.0	107.0	230.0	0.86312
7/04	4	105.25	93.0	64.0	171.0	0.906276
8/04	2	163.5	163.5	148.0	179.0	
9/04	1	137.0	137.0	137.0	137.0	
10/04	2	196.0	196.0	128.0	264.0	
12/04	2	169.5	169.5	111.0	228.0	
3/05	2	293.0	293.0	157.0	429.0	
4/05	1	135.0	135.0	135.0	135.0	
5/05	1	119.0	119.0	119.0	119.0	
6/05	1	254.0	254.0	254.0	254.0	
7/05	2	198.0	198.0	186.0	210.0	
9/05	2	256.0	256.0	236.0	276.0	
10/05	2	183.5	183.5	183.0	184.0	
12/05	2	283.5	283.5	127.0	440.0	
2/06	2	158.5	158.5	100.0	217.0	
4/06	4	164.5	105.0	95.0	353.0	1.62425
5/06	1	191.0	191.0	191.0	191.0	
6/06	2	189.0	189.0	134.0	244.0	
8/06	2	167.0	167.0	133.0	201.0	
4/07	4	177.5	122.5	86.0	379.0	1.55011
5/07	3	100.667	97.0	94.0	111.0	1.07586
6/07	2	205.5	205.5	128.0	283.0	
Total	2101	153.218	127.0	0.0	2167.0	159.905

Summary Statistics Monthly Averages and Medians

Data variable: DO_Probe (mg/L)

<i>Collection_Date_Time</i>	<i>Count</i>	<i>Average</i>	<i>Median</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Standardized</i>
8/75	1	8.6	8.6	8.6	8.6	
3/79	1	11.8	11.8	11.8	11.8	
11/91	10	9.48	10.1	7.8	11.3	-0.289718
12/91	5	10.82	10.8	10.0	11.5	-0.557136
1/92	17	11.6059	11.8	10.0	12.7	-0.842345
2/92	10	12.78	12.85	12.2	13.3	-0.287998
3/92	5	10.36	10.4	9.8	11.0	0.38524
4/92	19	10.7158	11.0	9.4	11.9	-0.598243
5/92	4	9.325	9.65	7.9	10.1	-1.33484
6/92	5	8.16	8.4	6.8	8.8	-1.64647
7/92	14	6.58571	6.6	4.9	7.9	-0.363549
8/92	10	8.11	8.2	6.1	9.9	-0.523629
9/92	7	8.04286	8.3	6.3	10.4	0.496302
10/92	14	9.48571	9.65	6.8	11.1	-1.48463
11/92	10	10.27	10.3	9.2	11.3	-0.109051
12/92	5	11.5	11.5	10.6	12.1	-0.882762
1/93	17	11.6	11.2	9.9	14.2	1.76271
2/93	10	12.82	12.95	12.2	13.6	0.0595918
3/93	5	11.72	11.8	10.9	12.6	0.197971
4/93	14	10.7929	10.7	9.9	13.3	3.53437
5/93	9	9.46667	9.6	7.8	11.3	-0.0308459
6/93	6	8.05	8.3	7.2	8.7	-0.710466
7/93	11	6.97273	6.6	5.4	9.1	0.552937
8/93	12	6.925	6.4	4.2	9.3	0.172585
9/93	9	7.75556	7.7	7.4	8.6	2.07654
10/93	11	8.95455	9.0	7.1	11.5	0.640522
11/93	13	10.8615	11.3	8.1	13.1	-0.849303

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1/94	14	13.2	13.25	12.1	14.2	-0.0628215
2/94	5	13.38	13.6	12.3	13.8	-1.87402
3/94	10	11.59	11.55	10.2	13.0	0.0362064
4/94	13	9.44615	9.6	8.0	10.3	-1.74986
5/94	10	9.12	9.25	7.1	9.9	-2.6946
6/94	6	7.2	6.85	6.0	8.6	0.520243
7/94	11	6.99091	7.2	5.1	9.1	-0.108387
8/94	8	7.525	7.4	5.7	9.2	0.0228396
9/94	4	8.65	8.5	7.7	9.9	0.372737
10/94	11	9.48182	9.7	7.4	11.6	-0.260376
11/94	10	9.06	8.85	7.1	11.7	0.511084
12/94	5	10.2	10.4	8.5	11.4	-1.01765
1/95	13	12.4462	12.4	11.1	13.9	0.17719
2/95	9	12.1333	12.1	11.8	12.8	1.38478
3/95	5	11.3	11.6	10.2	11.8	-1.66907
4/95	13	10.1692	10.2	8.9	11.1	-0.41112
5/95	11	8.71818	8.3	7.3	10.3	0.511027
6/95	4	8.5	8.65	7.0	9.7	-0.62348
7/95	13	6.80769	6.7	5.3	8.5	0.397847
8/95	12	7.09167	6.95	5.4	8.8	0.274373
9/95	7	8.0	8.1	6.4	8.9	-1.67266
10/95	12	8.33333	8.2	7.3	9.9	1.02852
11/95	5	12.68	12.4	12.3	13.9	1.96861
12/95	5	12.24	12.3	10.6	13.3	-1.01145
1/96	6	13.3667	13.55	12.3	14.2	-0.60964
2/96	11	13.7818	13.6	12.2	15.0	-0.275021
3/96	10	12.73	12.65	12.0	13.6	0.403168
4/96	13	10.8308	12.0	6.2	12.8	-1.7391
5/96	9	10.3333	10.4	9.5	10.9	-1.59707
6/96	5	9.02	9.1	7.9	9.8	-1.01614
7/96	13	7.38462	7.5	5.2	8.8	-1.77863
8/96	11	8.60909	8.7	7.6	9.9	0.327066
9/96	6	8.88333	9.05	7.7	9.5	-1.70146
10/96	3	9.1	9.6	7.8	9.9	-1.12932
11/96	11	12.6455	12.9	11.5	13.3	-1.49527
12/96	10	11.85	11.85	11.1	12.5	-0.428482
1/97	5	11.74	11.9	10.7	12.6	-0.52849
2/97	14	11.8214	12.0	11.0	12.9	-0.0268298
3/97	11	12.0273	11.5	10.7	13.8	0.464193
4/97	5	9.02	9.2	8.2	9.7	-0.470354
5/97	9	8.05556	8.0	6.9	9.2	-0.00472205
6/97	11	9.66364	9.7	8.0	10.6	-2.13938
7/97	5	9.06	9.0	7.0	11.3	0.228073
8/97	10	7.17	7.4	5.2	9.0	-0.4736
9/97	13	7.94615	8.1	6.2	8.6	-2.29192
10/97	7	8.87143	8.8	7.4	11.3	1.25407
11/97	7	11.4143	11.5	10.5	12.0	-1.04221
12/97	16	13.1375	13.2	10.6	14.3	-1.92813
1/98	5	12.0	12.2	10.7	13.0	-0.73608
2/98	12	11.8333	11.75	10.4	13.3	0.30958
3/98	10	11.75	11.7	10.3	13.0	-0.0482633
4/98	5	9.2	9.2	8.5	10.0	0.384574
5/98	8	9.6625	9.75	7.8	10.7	-1.33093
6/98	11	9.06364	9.2	7.9	10.1	-0.243247
7/98	11	7.74545	8.0	6.5	8.6	-1.29788
8/98	17	6.39412	6.5	3.9	8.7	-0.371477
9/98	2	7.4	7.4	7.3	7.5	
10/98	5	8.02	8.2	6.7	8.7	-1.30557
11/98	7	8.88571	8.1	6.3	12.0	0.429193
12/98	10	11.94	11.7	10.6	14.5	1.58445
1/99	34	13.1176	13.1	12.5	13.9	0.413136

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2/99	44	12.9091	12.7	11.8	15.5	1.74985
3/99	28	13.7643	13.8	12.9	14.8	0.302519
4/99	58	10.2793	10.1	8.7	12.5	1.65572
5/99	56	9.38929	9.4	8.3	10.6	0.322821
6/99	26	7.06923	7.5	5.5	8.2	-1.27897
7/99	105	7.11905	6.7	5.1	10.3	3.88614
8/99	41	7.48293	7.2	4.8	11.2	2.14014
9/99	80	7.80625	7.9	5.3	11.0	-0.167103
10/99	45	10.4022	10.1	9.6	12.2	3.80282
11/99	98	11.1071	10.8	9.2	14.4	2.81899
12/99	53	13.017	12.6	10.8	18.1	3.98561
1/00	24	14.3875	14.3	13.3	16.4	1.291
2/00	23	13.7696	13.9	13.3	14.8	1.66018
3/00	130	11.3577	11.2	8.0	14.3	-0.436532
4/00	55	9.92873	9.9	8.6	11.5	1.56868
5/00	135	8.49444	8.3	6.0	11.2	2.62326
6/00	59	7.0839	7.3	5.8	7.87	-1.68865
7/00	125	7.0728	7.23	5.16	8.6	-1.33695
8/00	60	6.87833	6.62	5.92	8.56	2.9903
9/00	100	5.9675	5.975	5.07	6.86	-0.928633
10/00	17	5.63	5.78	4.65	5.98	-2.29647
11/00	40	8.895	7.15	5.82	13.01	1.35955
12/00	24	13.4175	13.3	13.11	13.88	1.0515
3/01	61	11.5226	11.49	10.71	14.43	5.21347
4/01	50	11.647	11.79	9.71	14.91	0.455268
5/01	70	9.91214	9.735	8.97	12.24	3.70212
6/01	55	7.88273	7.54	6.44	9.82	1.05908
8/01	45	8.00556	7.78	6.41	9.98	0.675552
9/01	74	7.86676	7.96	5.99	9.76	-0.206479
10/01	114	9.13561	9.48	3.13	11.12	-4.33174
11/01	78	11.4546	12.49	7.92	13.87	-2.15889
12/01	108	11.0878	11.17	7.98	13.56	-2.64265
1/02	66	12.2564	12.67	10.43	13.24	-2.49119
2/02	80	12.9323	12.98	11.03	14.56	-1.7869
3/02	66	10.9691	11.03	10.01	12.04	0.583799
4/02	119	10.4067	10.68	7.27	12.5	-3.12963
5/02	130	8.85785	8.79	8.02	10.12	2.97479
6/02	109	7.54358	7.41	4.84	9.44	2.55985
7/02	73	6.66507	6.45	4.99	8.21	2.91587
10/02	22	9.79636	9.75	9.64	10.07	1.41904
2/03	22	11.7645	11.33	10.69	13.69	1.85526
3/03	94	12.5732	13.22	8.93	14.06	-5.69334
4/03	120	11.1231	11.41	8.16	15.74	0.136214
5/03	11	11.1136	10.47	9.94	13.66	1.82196
6/03	119	8.53933	8.38	4.72	9.96	-4.79285
7/03	33	8.35061	8.48	5.73	9.35	-4.44515
8/03	30	8.003	7.9	7.6	8.56	1.56617
9/03	29	8.27828	8.27	7.23	9.54	0.849681
10/03	30	10.67	10.595	9.8	11.54	0.240417
11/03	15	11.232	11.27	10.46	12.13	0.250806
12/03	16	13.835	14.23	11.14	15.51	-1.78845
1/04	7	15.0271	15.05	14.22	16.73	1.10997
2/04	18	13.9139	13.865	13.44	14.52	0.550192
3/04	15	12.552	12.69	11.3	13.41	-1.43389
4/04	24	11.0037	11.06	9.95	12.05	-0.269262
5/04	18	9.47833	9.435	8.51	10.27	-0.0754824
6/04	54	8.35944	8.11	5.48	11.9	1.37337
7/04	55	7.42509	7.08	4.58	10.27	2.03116
8/04	33	7.41727	7.44	6.16	8.81	0.219718
9/04	53	8.00698	7.65	6.47	10.17	1.41566
10/04	34	10.3774	10.55	9.12	11.4	-1.17298

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11/04	27	12.3233	13.33	8.79	13.69	-2.89204
12/04	40	12.576	12.01	10.42	15.4	1.01484
1/05	28	12.2789	12.03	10.88	14.9	2.58245
2/05	14	13.6336	13.635	12.2	15.07	0.0125559
3/05	49	12.9298	13.76	8.04	16.03	-3.61716
4/05	35	11.4294	11.3	9.16	16.6	2.20931
5/05	33	10.0873	9.99	8.9	12.3	3.14387
6/05	40	9.266	9.43	7.39	11.01	-1.5929
7/05	61	8.0159	7.92	5.12	10.14	-1.78669
8/05	9	7.80667	7.71	7.4	8.31	0.545004
9/05	54	8.52944	8.295	6.76	12.38	4.0074
10/05	18	11.8283	11.855	11.13	12.96	1.05596
11/05	32	10.9937	10.78	9.47	13.51	1.15976
12/05	6	15.04	15.11	14.29	15.89	0.0131321
1/06	54	12.5317	12.92	9.09	14.05	-3.68401
2/06	8	12.9325	14.245	9.92	15.08	-0.620961
3/06	38	12.6263	12.8	9.8	17.4	0.581189
4/06	26	11.5808	11.35	10.6	13.7	2.38896
5/06	59	9.66949	9.9	6.6	12.6	-0.669085
6/06	32	7.79062	7.95	6.0	9.2	-1.04981
7/06	55	7.61091	7.6	5.7	10.0	0.718068
8/06	44	7.22955	7.0	4.7	9.9	0.970097
9/06	31	9.14516	8.8	8.2	11.0	3.04216
10/06	21	10.2952	10.4	8.7	13.5	2.0126
11/06	43	12.107	12.2	10.6	14.1	0.730757
12/06	10	14.13	13.5	12.9	16.5	1.14426
1/07	19	12.9474	12.1	10.1	16.6	0.208326
2/07	19	13.9158	14.0	13.2	15.1	1.00845
3/07	29	13.1172	12.8	12.2	14.4	0.495297
4/07	35	12.3743	12.3	10.9	15.0	1.02016
5/07	58	9.97069	10.35	6.7	12.6	-1.97856
6/07	29	7.93448	8.2	3.2	9.8	-3.99097
Total	5460	9.8566	9.82	3.13	18.1	4.0349

Summary Statistics Monthly averages and medians

Data variable: Phos_P (mg/L)

Phos_P_dte	Count	Average	Median	Minimum	Maximum	Standardized
						Skewness
7/79	9	0.0611111	0.05	0.05	0.1	1.9839
8/79	15	0.1233333	0.1	0.05	0.4	3.189
9/79	3	0.05	0.05	0.05	0.05	-1.73205
10/79	9	0.1277778	0.1	0.05	0.3	1.31085
11/79	9	0.1	0.1	0.05	0.2	1.81827
12/79	9	0.0555556	0.05	0.05	0.1	3.67423
1/80	10	0.095	0.1	0.05	0.2	1.8911
2/80	9	0.0211111	0.01	0.005	0.05	1.00943
3/80	11	0.0681818	0.05	0.05	0.1	0.894575
4/80	9	0.1444444	0.1	0.05	0.4	2.20338
5/80	9	0.116667	0.1	0.05	0.2	1.31223
6/80	9	0.122222	0.1	0.05	0.3	1.33495
7/80	4	0.075	0.075	0.05	0.1	-1.22663E-15
8/80	4	0.0625	0.05	0.05	0.1	1.63299
11/80	9	0.0888889	0.05	0.05	0.3	3.22515
12/80	9	0.0888889	0.05	0.05	0.2	1.70768
1/81	2	0.05	0.05	0.05	0.05	
2/81	9	0.6	0.7	0.1	1.5	0.844929
3/81	9	0.0777778	0.05	0.05	0.2	2.59807
4/81	9	0.0666667	0.05	0.05	0.1	1.04978
5/81	9	0.0722222	0.05	0.05	0.1	0.33197
6/81	9	0.1444444	0.1	0.05	0.4	2.20338

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7/81	8	0.075	0.075	0.05	0.1	-1.17107E-15
8/81	9	0.0944444	0.1	0.05	0.2	1.80031
9/81	9	0.116667	0.1	0.05	0.3	2.01422
10/81	9	0.0777778	0.05	0.05	0.2	2.59807
11/81	9	0.0888889	0.1	0.05	0.2	1.95922
12/81	9	0.116667	0.05	0.05	0.3	1.78704
1/82	9	0.194444	0.2	0.05	0.5	1.1544
2/82	9	0.238889	0.3	0.05	0.5	0.41612
3/82	9	0.0722222	0.05	0.05	0.1	0.33197
4/82	9	0.05	0.05	0.05	0.05	1.48461
5/82	9	0.0722222	0.05	0.05	0.1	0.33197
6/82	9	0.166667	0.2	0.1	0.2	-1.04978
7/82	9	0.0555556	0.05	0.05	0.1	3.67423
9/82	9	0.15	0.2	0.05	0.2	-0.642857
10/82	9	0.156667	0.1	0.05	0.3	0.732691
11/82	9	0.0666667	0.05	0.05	0.15	2.59808
12/82	9	0.0888889	0.05	0.05	0.2	1.70768
1/83	3	0.05	0.05	0.05	0.05	-1.73205
2/83	9	0.0777778	0.05	0.05	0.2	2.59807
3/83	9	0.242222	0.3	0.05	0.35	-0.980008
4/83	9	0.05	0.05	0.05	0.05	1.48461
5/83	9	0.0611111	0.05	0.05	0.1	1.9839
6/83	9	0.216667	0.2	0.05	0.5	1.03356
7/83	9	0.116667	0.1	0.05	0.2	0.566829
8/83	9	0.144444	0.1	0.05	0.6	3.20246
9/83	9	0.188889	0.05	0.05	0.85	2.98445
10/83	9	0.166667	0.1	0.05	0.3	0.468997
11/83	9	0.0922222	0.1	0.03	0.15	0.186674
12/83	9	0.137778	0.13	0.1	0.2	1.27359
1/84	1	0.05	0.05	0.05	0.05	
2/84	9	0.102222	0.1	0.05	0.16	0.469079
3/84	9	0.0722222	0.05	0.05	0.2	3.06918
4/84	9	0.05	0.05	0.05	0.05	1.48461
5/84	9	0.0611111	0.05	0.05	0.1	1.9839
6/84	8	0.09375	0.05	0.05	0.2	1.39699
7/84	9	0.108889	0.1	0.05	0.3	2.72596
8/84	8	0.14375	0.1	0.05	0.6	3.14999
9/84	9	0.133333	0.05	0.05	0.5	2.83913
10/84	8	0.14375	0.075	0.05	0.5	2.50335
1/85	7	0.0928571	0.1	0.05	0.2	1.64184
2/85	9	0.155556	0.2	0.1	0.2	-0.33197
3/85	9	0.0611111	0.05	0.05	0.1	1.9839
5/85	2	0.15	0.15	0.1	0.2	
6/85	7	0.228571	0.2	0.2	0.3	1.32816
7/85	9	0.327778	0.05	0.05	1.8	3.20304
9/85	9	0.355556	0.1	0.05	2.0	3.08214
10/85	9	0.263333	0.3	0.1	0.6	1.25798
11/85	7	0.0928571	0.05	0.05	0.3	2.64267
12/85	9	0.05	0.05	0.05	0.05	1.48461
1/86	9	0.1	0.05	0.05	0.3	2.21727
2/86	6	0.0833333	0.05	0.05	0.2	1.95171
3/86	9	0.0611111	0.05	0.05	0.1	1.9839
4/86	9	0.05	0.05	0.05	0.05	1.48461
5/86	9	0.122222	0.2	0.02	0.2	-0.33854
6/86	7	0.1	0.1	0.1	0.1	1.4
7/86	9	0.206667	0.2	0.05	0.7	2.62794
8/86	4	0.0875	0.06	0.03	0.2	1.10306
9/86	9	0.134444	0.2	0.01	0.3	0.0523295
10/86	9	0.167778	0.1	0.05	0.5	2.1288
11/86	1	0.1	0.1	0.1	0.1	
12/86	1	0.1	0.1	0.1	0.1	

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1/87	1	0.1	0.1	0.1	0.1	
2/87	1	0.05	0.05	0.05	0.05	
3/87	1	0.05	0.05	0.05	0.05	
4/87	9	0.155556	0.2	0.1	0.2	-0.33197
5/87	9	0.0611111	0.05	0.05	0.1	1.9839
6/87	9	0.111111	0.1	0.1	0.2	3.67423
7/87	8	0.11875	0.1	0.05	0.2	1.0541
8/87	8	0.1125	0.1	0.1	0.2	3.26599
9/87	8	0.10625	0.1	0.05	0.2	1.0116
10/87	8	0.075	0.05	0.05	0.2	2.70031
11/87	8	0.05625	0.05	0.05	0.1	3.26599
12/87	8	0.1125	0.1	0.1	0.2	3.26599
1/88	5	0.05	0.05	0.05	0.05	
2/88	6	0.0833333	0.1	0.05	0.1	-0.968246
3/88	7	0.107143	0.1	0.05	0.2	0.86212
4/88	8	0.1	0.1	0.1	0.1	1.44016
5/88	7	0.178571	0.1	0.05	0.4	1.07465
6/88	8	0.1125	0.1	0.1	0.2	3.26599
7/88	8	0.1125	0.1	0.1	0.2	3.26599
8/88	8	0.14375	0.1	0.05	0.3	1.19683
9/88	8	0.1	0.1	0.1	0.1	1.44016
10/88	8	0.0875	0.075	0.05	0.2	1.93361
11/88	8	0.11875	0.1	0.05	0.2	1.0541
1/89	1	0.05	0.05	0.05	0.05	
2/89	7	0.0928571	0.1	0.05	0.1	-2.85774
3/89	8	0.08125	0.1	0.05	0.1	-0.743698
4/89	8	0.0825	0.1	0.05	0.11	-0.669565
5/89	8	0.20625	0.15	0.05	0.5	1.22121
6/89	7	0.107143	0.05	0.05	0.35	2.59523
7/89	7	0.0857143	0.1	0.05	0.1	-1.32816
8/89	8	0.10625	0.1	0.05	0.2	1.95132
9/89	7	0.114286	0.05	0.05	0.3	1.55983
10/89	7	0.0857143	0.05	0.05	0.2	1.92652
11/89	7	0.0928571	0.1	0.05	0.2	1.64184
12/89	6	0.0833333	0.05	0.05	0.2	1.95171
1/90	7	0.0928571	0.1	0.05	0.1	-2.85774
2/90	7	0.0714286	0.05	0.05	0.2	2.85774
3/90	7	0.0714286	0.05	0.05	0.1	0.404145
4/90	5	0.24	0.2	0.1	0.5	0.993671
5/90	7	0.15	0.1	0.05	0.4	2.12992
6/90	7	0.0928571	0.1	0.05	0.1	-2.85774
7/90	7	0.114286	0.1	0.1	0.2	2.85774
8/90	7	0.0864286	0.05	0.005	0.2	1.10989
9/90	11	0.140909	0.1	0.05	0.5	3.03366
10/90	8	0.08125	0.1	0.05	0.1	-0.743698
11/90	4	0.0625	0.05	0.05	0.1	1.63299
12/90	3	0.05	0.05	0.05	0.05	-1.73205
1/91	14	0.0857143	0.05	0.05	0.2	2.36313
2/91	4	0.1	0.1	0.1	0.1	
3/91	4	0.05	0.05	0.05	0.05	
4/91	11	0.0545455	0.05	0.05	0.1	4.49073
5/91	8	0.0875	0.075	0.05	0.2	1.93361
6/91	5	0.12	0.1	0.05	0.3	1.75066
7/91	10	0.175	0.075	0.05	0.8	3.01428
8/91	5	0.18	0.1	0.05	0.6	1.98426
9/91	4	0.1875	0.2	0.05	0.3	-0.100993
10/91	7	0.178571	0.1	0.05	0.6	2.55352
11/91	8	0.1	0.075	0.05	0.3	2.73252
12/91	5	0.18	0.1	0.1	0.4	1.56502
1/92	14	0.1	0.1	0.05	0.2	2.6232
2/92	10	0.065	0.05	0.05	0.1	1.33631

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3/92	5	0.05	0.05	0.05	0.05	
4/92	16	0.0875	0.1	0.05	0.1	-2.08656
5/92	4	0.1125	0.1	0.05	0.2	0.922101
6/92	5	0.19	0.05	0.05	0.5	1.02061
7/92	12	0.1625	0.1	0.05	0.9	4.66177
8/92	9	0.0777778	0.1	0.05	0.1	-0.33197
9/92	5	0.1	0.05	0.05	0.3	2.04124
10/92	12	0.0958333	0.05	0.05	0.5	4.7118
11/92	8	0.0875	0.1	0.05	0.1	-1.66296
12/92	5	0.05	0.05	0.05	0.05	
1/93	14	0.0678571	0.05	0.05	0.1	1.02399
2/93	4	0.05	0.05	0.05	0.05	
3/93	5	0.05	0.05	0.05	0.05	
4/93	12	0.0666667	0.05	0.05	0.1	1.14891
5/93	8	0.069375	0.05	0.005	0.2	2.13828
6/93	6	0.05	0.05	0.05	0.05	1.36931
7/93	11	0.168182	0.05	0.05	1.2	4.45447
8/93	11	0.113636	0.05	0.05	0.4	2.65526
10/93	10	0.18	0.1	0.05	0.6	2.23229
11/93	11	0.0636364	0.05	0.05	0.2	4.49073
1/94	10	0.185	0.15	0.05	0.4	1.37982
2/94	5	0.05	0.05	0.05	0.05	
3/94	9	0.0555556	0.05	0.05	0.1	3.67423
4/94	11	0.0727273	0.05	0.05	0.2	3.2611
5/94	9	0.05	0.05	0.05	0.05	1.48461
6/94	6	0.075	0.075	0.05	0.1	1.18768E-15
7/94	10	0.24	0.1	0.05	1.6	4.01481
8/94	6	0.0833333	0.075	0.05	0.15	0.857321
9/94	4	0.075	0.075	0.05	0.1	-1.22663E-15
10/94	11	0.177273	0.05	0.05	1.3	4.38035
11/94	9	0.138889	0.1	0.05	0.3	1.50057
12/94	5	0.05	0.05	0.05	0.05	
1/95	11	0.0909091	0.05	0.05	0.2	1.81913
2/95	8	0.05	0.05	0.05	0.05	1.44016
3/95	5	0.05	0.05	0.05	0.05	
4/95	11	0.0636364	0.05	0.05	0.1	1.61042
5/95	10	0.11	0.1	0.1	0.2	4.08248
6/95	4	0.1	0.1	0.1	0.1	
7/95	11	0.122727	0.1	0.05	0.2	1.09311
8/95	11	0.109091	0.1	0.05	0.2	1.51812
9/95	5	0.1	0.1	0.1	0.1	
10/95	11	0.0727273	0.05	0.05	0.3	4.49073
11/95	4	0.05	0.05	0.05	0.05	
12/95	5	0.05	0.05	0.05	0.05	
1/96	5	0.05	0.05	0.05	0.05	
2/96	10	0.055	0.05	0.05	0.1	4.08248
3/96	9	0.05	0.05	0.05	0.05	1.48461
4/96	11	0.0590909	0.05	0.05	0.1	2.60337
5/96	8	0.05	0.05	0.05	0.05	1.44016
6/96	5	0.06	0.05	0.05	0.1	2.04124
7/96	11	0.0636364	0.05	0.05	0.1	1.61042
8/96	10	0.13	0.05	0.05	0.4	1.8953
9/96	6	0.0916667	0.1	0.05	0.1	-2.44949
10/96	2	0.05	0.05	0.05	0.05	
11/96	10	0.05	0.05	0.05	0.05	1.53093
12/96	9	0.116667	0.05	0.05	0.2	0.33197
1/97	5	0.1	0.1	0.05	0.2	1.24226
2/97	12	0.0708333	0.05	0.05	0.1	0.549285
3/97	10	0.05	0.05	0.05	0.05	1.53093
4/97	5	0.1	0.1	0.1	0.1	
5/97	12	0.0625	0.05	0.05	0.1	1.87617

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6/97	10	0.06	0.05	0.05	0.1	2.2964
7/97	5	0.08	0.1	0.05	0.1	-0.555556
8/97	9	0.0666667	0.05	0.05	0.1	1.04978
9/97	9	0.0888889	0.1	0.05	0.2	1.95922
10/97	7	0.0857143	0.1	0.05	0.1	-1.32816
11/97	6	0.0583333	0.05	0.05	0.1	2.44949
12/97	15	0.0666667	0.05	0.05	0.1	1.2463
1/98	5	0.07	0.05	0.05	0.1	0.555556
2/98	12	0.175	0.1	0.05	1.2	4.84997
3/98	9	0.0888889	0.1	0.05	0.1	-1.9839
4/98	5	0.1	0.1	0.1	0.1	
5/98	6	0.1	0.1	0.1	0.1	1.36931
6/98	10	0.11	0.1	0.1	0.2	4.08248
7/98	10	0.1	0.1	0.05	0.2	1.97642
8/98	14	0.0928571	0.1	0.05	0.1	-3.5054
10/98	5	0.05	0.05	0.05	0.05	
11/98	6	0.075	0.075	0.05	0.1	-1.18768E-15
12/98	10	0.06	0.05	0.05	0.1	2.2964
1/99	9	0.2	0.2	0.1	0.3	-2.89732E-15
2/99	12	0.0875	0.1	0.05	0.2	2.22681
3/99	10	0.05	0.05	0.05	0.05	1.53093
4/99	12	0.0708333	0.05	0.05	0.2	3.59073
5/99	10	0.065	0.05	0.05	0.2	4.08248
6/99	5	0.05	0.05	0.05	0.05	
7/99	13	0.0730769	0.06	0.03	0.25	4.28473
8/99	6	0.0616667	0.05	0.04	0.1	1.14753
9/99	12	0.1525	0.06	0.03	1.05	4.76629
10/99	10	0.04	0.04	0.01	0.11	1.93965
11/99	14	0.186429	0.04	0.03	1.99	5.68636
12/99	11	0.0218182	0.02	0.01	0.03	-0.0374228
1/00	4	0.03	0.025	0.02	0.05	1.1547
2/00	2	0.71	0.71	0.02	1.4	
3/00	17	0.252353	0.04	0.02	3.6	6.93124
4/00	6	0.0233333	0.02	0.01	0.04	0.665669
5/00	18	0.065	0.04	0.02	0.22	3.11827
6/00	6	0.0683333	0.065	0.05	0.1	0.505524
7/00	16	0.045	0.05	0.03	0.07	0.484873
8/00	6	0.0666667	0.06	0.04	0.1	0.455086
9/00	17	0.0882353	0.05	0.02	0.43	4.44223
10/00	5	0.032	0.03	0.01	0.05	-0.503556
11/00	13	0.0344615	0.02	0.01	0.2	5.07525
12/00	9	0.0116667	0.01	0.005	0.03	2.01422
1/01	14	0.200714	0.1	0.02	1.1	4.11097
2/01	5	0.034	0.04	0.02	0.04	-1.1482
3/01	11	0.0390909	0.03	0.02	0.13	3.99043
4/01	10	0.036	0.03	0.01	0.07	0.963772
5/01	13	0.0438462	0.03	0.02	0.14	4.42739
6/01	11	0.0472727	0.05	0.04	0.07	2.21765
8/01	1	0.04	0.04	0.04	0.04	
9/01	10	0.126	0.075	0.03	0.3	0.930481
10/01	8	0.05375	0.03	0.02	0.21	2.90268
11/01	8	0.0475	0.02	0.01	0.24	3.20505
12/01	8	0.0725	0.04	0.01	0.33	3.11716
1/02	8	0.05375	0.03	0.01	0.25	3.18213
2/02	9	0.0522222	0.02	0.005	0.25	2.99898
3/02	8	0.04625	0.035	0.01	0.11	1.28645
4/02	9	0.04	0.03	0.01	0.17	3.39541
5/02	15	0.054	0.04	0.01	0.12	0.901467
6/02	8	0.06375	0.06	0.02	0.13	1.23863
7/02	8	0.07125	0.055	0.02	0.22	2.58403
10/02	3	0.0366667	0.03	0.02	0.06	0.914531

2/03	3	0.03	0.03	0.02	0.04	-1.12302E-15
3/03	10	0.038	0.035	0.02	0.06	0.263495
4/03	12	0.105833	0.025	0.01	0.52	2.89374
6/03	12	0.0708333	0.06	0.03	0.18	2.28398
7/03	6	0.0483333	0.05	0.03	0.06	-0.667628
8/03	7	0.0485714	0.05	0.03	0.07	0.0761851
9/03	6	0.0933333	0.045	0.01	0.36	2.26828
10/03	7	0.03	0.03	0.01	0.06	0.496951
11/03	5	0.038	0.04	0.02	0.07	0.933293
12/03	7	0.0271429	0.03	0.02	0.04	0.642991
1/04	5	0.022	0.02	0.02	0.03	2.04124
2/04	5	0.034	0.03	0.02	0.06	0.993671
3/04	5	0.02	0.02	0.01	0.03	-6.83447E-16
4/04	7	0.0257143	0.02	0.01	0.04	0.254021
5/04	3	0.0433333	0.04	0.04	0.05	1.22474
6/04	10	0.054	0.05	0.04	0.11	3.10851
7/04	6	0.0466667	0.04	0.01	0.09	0.392301
8/04	8	0.0625	0.05	0.04	0.13	2.36273
9/04	7	0.0542857	0.05	0.04	0.07	0.298835
10/04	9	0.0511111	0.05	0.02	0.12	2.07221
11/04	3	0.0366667	0.04	0.03	0.04	-1.22474
12/04	8	0.03125	0.02	0.02	0.07	1.89304
1/05	6	0.0433333	0.04	0.02	0.07	0.254274
2/05	1	0.03	0.03	0.03	0.03	
3/05	13	0.0253846	0.02	0.01	0.05	1.73375
4/05	1	0.06	0.06	0.06	0.06	
5/05	2	0.055	0.055	0.04	0.07	
6/05	3	0.0533333	0.05	0.05	0.06	1.22474
7/05	13	0.0661538	0.05	0.03	0.13	1.0448
8/05	2	0.045	0.045	0.04	0.05	
9/05	13	0.0453846	0.04	0.02	0.11	2.83208
10/05	5	0.042	0.04	0.03	0.05	-0.46761
11/05	8	0.035	0.025	0.02	0.09	2.33457
12/05	3	0.02	0.02	0.02	0.02	
1/06	9	0.0655556	0.06	0.03	0.15	1.7132
2/06	3	0.0166667	0.02	0.01	0.02	-1.22474
3/06	8	0.025	0.025	0.02	0.03	-1.52483E-15
4/06	3	0.0266667	0.02	0.02	0.04	1.22474
5/06	8	0.05125	0.045	0.02	0.1	0.944568
6/06	3	0.04	0.04	0.04	0.04	
7/06	7	0.0557143	0.05	0.03	0.09	0.680441
8/06	3	0.04	0.04	0.03	0.05	0.0
9/06	1	0.04	0.04	0.04	0.04	
10/06	1	0.04	0.04	0.04	0.04	
11/06	4	0.04	0.035	0.03	0.06	1.1547
12/06	3	0.0466667	0.04	0.02	0.08	0.6613
1/07	6	0.0233333	0.02	0.01	0.04	0.665669
2/07	1	0.03	0.03	0.03	0.03	
3/07	6	0.02	0.02	0.01	0.03	-5.32694E-16
4/07	8	0.02625	0.025	0.02	0.04	0.951206
5/07	7	0.03	0.03	0.02	0.04	1.38657E-15
6/07	8	0.05625	0.05	0.03	0.13	2.28722
Total	2482	0.0950657	0.05	0.005	3.6	215.094

Summary Statistics Monthly averages and medians

Data variable: Nitrogen_N (mg/L)

	Count	Average	Median	Minimum	Maximum	Standardized
Nitrogen_N_dte						
7/03	5	1.266	1.42	0.75	1.52	-1.40866
8/03	6	1.26667	0.99	0.59	3.21	2.23276

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9/03	6	1.51167	1.57	0.71	2.08	-0.569442
10/03	6	0.96	1.055	0.45	1.22	-1.16648
11/03	5	1.262	1.39	0.76	1.56	-0.719547
12/03	6	1.35333	1.46	0.64	1.99	-0.331125
1/04	5	1.918	1.8	1.12	3.01	0.919271
2/04	5	1.474	1.61	0.93	1.77	-1.42429
3/04	5	1.152	1.04	0.83	1.69	1.15344
4/04	6	1.0	0.96	0.44	1.51	-0.0190248
5/04	3	1.14333	1.21	0.92	1.3	-0.947853
6/04	9	1.27222	1.31	0.66	1.66	-1.05025
7/04	6	1.295	1.24	0.48	2.54	1.04732
8/04	7	0.955714	0.98	0.64	1.33	0.316311
9/04	8	1.12375	0.875	0.63	2.83	2.62196
10/04	8	1.26125	1.3	0.4	1.59	-2.28046
11/04	3	1.05	0.69	0.51	1.95	1.15263
12/04	7	1.28857	1.33	0.63	1.79	-0.440757
1/05	6	1.98167	2.1	1.17	2.43	-1.29453
2/05	1	1.76	1.76	1.76	1.76	
3/05	12	1.20833	1.225	0.7	1.88	0.275952
4/05	1	1.65	1.65	1.65	1.65	
5/05	2	1.245	1.245	1.18	1.31	
6/05	3	1.14	1.06	1.02	1.34	1.15263
7/05	12	1.195	1.16	0.74	1.8	0.877924
8/05	2	0.86	0.86	0.76	0.96	
9/05	12	0.983333	0.705	0.6	2.14	2.22164
10/05	4	1.3025	1.335	1.05	1.49	-0.672642
11/05	8	1.36375	1.155	0.65	2.13	0.425014
12/05	3	0.96	0.88	0.64	1.36	0.6613
1/06	9	1.5	1.44	1.14	1.92	0.402486
2/06	3	0.86	0.68	0.68	1.22	1.22474
3/06	8	1.40375	1.365	0.97	1.99	0.756346
4/06	3	0.636667	0.72	0.28	0.91	-0.765972
5/06	8	1.24125	1.17	0.67	2.0	0.518674
6/06	2	0.76	0.76	0.74	0.78	
7/06	7	1.15	1.0	0.73	1.87	1.2199
8/06	3	0.696667	0.75	0.54	0.8	-1.04626
9/06	1	0.97	0.97	0.97	0.97	
10/06	1	0.36	0.36	0.36	0.36	
11/06	4	1.415	1.4	1.02	1.84	0.142789
12/06	3	1.53667	1.22	1.11	2.28	1.18493
1/07	6	1.475	1.27	0.91	2.74	1.97619
3/07	6	1.35667	1.31	0.81	1.97	0.324192
4/07	6	0.853333	0.74	0.22	1.82	0.793199
5/07	7	1.03143	0.89	0.69	1.77	1.56919
6/07	6	1.13333	1.06	0.6	2.14	1.56512
Total	255	1.22984	1.18	0.22	3.21	5.56736

Summary Statistics Monthly Averages and Medians

Data variable: Turbidity (NTU)

						Standardized
Turb_dte	Count	Average	Median	Minimum	Maximum	Skewness
7/94	11	22.6982	8.7	0.98	92.0	2.41167
8/94	6	7.38333	6.8	3.7	12.0	0.398896
9/94	4	4.325	4.2	1.4	7.5	0.145094
10/94	12	3.83333	3.1	1.47	10.6	2.26877
11/94	9	11.3778	4.2	1.3	66.0	3.61183
12/94	5	16.9	12.0	2.4	49.0	1.6016
1/95	12	11.3417	10.45	2.0	32.0	1.89033
2/95	8	9.975	7.4	3.9	26.0	2.03985
3/95	5	18.0	14.9	5.2	42.0	1.57942

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4/95	12	5.775	5.9	2.6	8.4	-0.103537
5/95	10	12.97	7.2	2.4	47.0	2.44036
6/95	4	17.2	18.1	8.6	24.0	-0.141157
7/95	12	28.4917	9.3	4.1	155.0	3.55288
8/95	11	7.79091	7.6	5.1	12.0	0.660317
9/95	5	4.98	3.9	2.5	10.3	1.54298
10/95	11	24.7427	3.56	1.37	235.0	4.48161
11/95	4	4.245	3.625	3.06	6.67	1.47859
12/95	5	6.74	4.2	3.1	13.0	0.747879
1/96	5	8.12	8.4	4.6	12.0	0.173524
2/96	11	6.82727	5.9	4.9	13.0	2.85297
3/96	9	5.57778	4.8	3.0	9.7	1.20445
4/96	12	14.7083	10.0	2.9	54.0	2.94952
5/96	8	19.6125	13.15	9.7	47.0	1.78006
6/96	5	11.4	10.9	5.7	18.7	0.725795
7/96	12	9.09167	8.2	3.9	26.0	3.43969
8/96	10	45.24	19.6	4.7	155.0	1.64066
9/96	6	9.31667	8.55	5.3	14.9	0.613963
10/96	2	3.75	3.75	2.8	4.7	
11/96	11	7.44545	6.4	3.8	25.7	4.05963
12/96	9	18.9	14.7	4.3	38.0	0.418437
1/97	5	9.08	4.8	2.9	21.0	0.971256
2/97	13	6.86923	5.9	3.3	13.3	1.40494
3/97	10	9.46	8.55	5.5	14.7	0.672298
4/97	5	5.32	3.6	2.6	10.2	0.948977
5/97	13	6.8	5.2	3.5	23.0	4.54138
6/97	10	13.85	12.6	4.5	26.0	0.367932
7/97	5	6.94	4.7	4.1	14.5	1.64311
8/97	10	8.64	6.55	3.8	27.0	3.14835
9/97	9	13.2778	8.5	2.0	28.0	0.356512
10/97	7	6.41429	5.1	1.5	21.4	2.37609
11/97	6	9.31667	8.6	4.7	17.4	1.08454
12/97	16	5.675	6.2	1.8	11.0	0.647921
1/98	5	11.04	11.8	6.2	14.6	-0.670155
2/98	13	24.6692	21.0	2.4	68.0	1.96388
3/98	9	14.7333	4.3	3.0	55.0	2.01181
4/98	5	6.26	6.0	4.5	9.1	1.23416
5/98	7	6.37857	6.3	2.24	12.3	0.663357
6/98	10	4.016	4.12	1.61	8.18	0.961509
7/98	10	4.69	5.14	1.26	7.97	-0.125705
8/98	15	7.46667	6.29	2.87	21.7	3.05497
10/98	5	2.372	1.46	1.15	5.19	1.54327
11/98	6	2.035	1.95	1.26	3.59	1.53358
12/98	11	3.39727	3.25	1.31	7.67	1.16737
1/99	9	12.9144	13.8	4.31	24.6	0.321447
2/99	13	31.0269	17.2	2.47	94.2	1.45017
3/99	10	6.613	4.545	2.37	23.5	3.21516
4/99	13	9.91923	7.5	1.95	30.2	2.23793
5/99	10	6.602	5.665	1.75	16.0	1.57374
6/99	5	10.474	4.97	4.11	23.9	1.03246
7/99	14	22.6643	8.105	3.45	208.5	5.65638
8/99	6	7.99667	4.88	4.02	17.7	1.3388
9/99	13	136.815	5.46	2.84	1540.0	5.26182
10/99	5	6.48	4.28	2.77	15.4	1.61081
11/99	14	6.86643	3.815	1.83	34.0	4.09813
12/99	11	2.95182	3.44	0.83	5.25	0.0922241
1/00	4	6.87	4.1	2.88	16.4	1.58066
2/00	2	2.385	2.385	1.87	2.9	
3/00	18	10.795	5.96	2.33	42.0	3.21963
4/00	6	5.38667	4.905	3.24	8.94	1.16819
5/00	19	15.5558	8.31	2.4	93.0	6.10793

6/00	6	12.2167	12.55	7.2	17.4	0.0216915
7/00	17	11.5741	6.5	2.76	34.1	2.27299
8/00	6	10.7333	6.245	4.65	23.0	0.979098
9/00	18	15.3928	6.195	1.79	61.0	2.78009
10/00	5	5.2	4.8	2.6	8.8	0.978816
11/00	13	4.7	4.7	1.4	9.4	0.664927
12/00	9	4.18889	3.5	1.8	8.1	1.3858
1/01	14	86.1136	25.15	3.46	453.0	3.35372
2/01	5	8.162	3.61	1.51	26.6	1.94549
3/01	12	5.34167	4.255	2.97	13.1	2.41652
4/01	10	11.141	8.045	4.09	28.1	2.19646
5/01	14	5.04857	4.35	2.29	10.8	2.20994
6/01	10	12.014	11.45	6.97	19.4	1.32271
8/01	1	11.9	11.9	11.9	11.9	
9/01	10	37.009	15.9	3.5	120.0	1.59521
10/01	8	2.5975	2.5	1.0	4.6	0.57306
11/01	8	2.96625	3.16	1.36	5.16	0.428608
12/01	8	14.475	7.25	1.6	38.7	1.15397
1/02	8	4.5125	3.9	1.8	11.7	2.26198
2/02	9	3.12222	2.8	1.1	6.2	0.797759
3/02	8	12.25	7.35	4.4	27.6	0.953761
4/02	9	2.87778	3.2	1.9	4.1	-0.0160703
5/02	13	9.41538	6.9	1.6	26.3	2.0104
6/02	9	5.56667	4.2	2.8	10.4	1.28867
7/02	8	5.5625	4.25	2.8	13.9	2.58522
10/02	3	4.0	5.1	1.3	5.6	-1.16275
2/03	3	6.63333	5.2	5.0	9.7	1.21695
Total	867	13.9644	6.1	0.83	1540.0	264.399

Summary Statistics

Data variable: Temp_Celsuis

						Standardized
Collection_Date_Temp	Count	Average	Median	Minimum	Maximum	Skewness
7/68	5	25.112	25.56	23.89	26.11	-0.475293
8/68	5	24.108	23.33	22.22	27.22	1.23126
9/68	5	21.888	21.67	21.11	23.33	0.990049
12/68	5	2.89	3.33	1.67	3.89	-0.400272
5/69	5	19.774	19.44	19.44	21.11	2.04124
8/69	5	23.222	22.78	22.22	25.56	1.52697
3/70	6	5.18333	4.44	3.33	8.89	1.76061
4/70	6	6.02	6.11	5.0	6.67	-0.663669
5/70	6	14.2567	14.44	12.22	16.11	-0.324208
6/70	6	19.63	20.0	18.33	20.56	-0.720686
7/70	6	24.2567	23.885	23.33	26.67	1.59006
8/70	5	25.442	24.44	24.44	27.22	0.636707
10/70	6	16.8533	16.67	15.56	18.33	0.389389
11/70	6	7.87	7.5	6.67	10.0	1.34321
12/70	6	7.315	7.22	6.67	7.78	-0.285844
1/71	6	2.68333	2.5	2.22	3.33	0.448885
2/71	6	0.186667	0.0	0.0	0.56	0.968246
3/71	5	4.778	5.0	3.89	5.56	-0.35467
4/71	6	16.115	16.115	15.56	16.67	-6.6695E-15
5/71	6	13.3317	13.33	12.22	13.89	-1.35699
6/71	6	22.8717	21.945	21.11	25.56	0.859633
7/71	6	26.9483	26.115	25.56	30.56	1.53262
8/71	6	23.9817	23.61	22.78	25.56	0.642971
9/71	6	23.425	23.33	20.56	27.22	0.825864
10/71	12	16.6675	16.67	15.56	17.78	0.00290394
11/71	4	6.25	6.11	6.11	6.67	1.63299
12/71	6	5.37333	5.56	4.44	5.56	-2.44949

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1/72	4	4.165	4.165	3.33	5.0	1.63406E-16
2/72	1	0.56	0.56	0.56	0.56	
3/72	6	6.945	6.945	5.56	8.33	-2.45578E-15
4/72	6	13.055	13.055	12.22	13.89	5.67481E-15
5/72	8	19.235	19.165	17.78	21.11	0.629262
6/72	5	21.0	21.11	20.0	21.67	-1.16882
7/72	7	19.2857	18.89	16.67	21.11	-0.287592
8/72	7	24.92	24.44	23.33	27.78	1.04866
9/72	6	20.74	20.555	18.89	23.33	0.382733
10/72	7	16.4314	15.56	15.56	18.89	1.48488
11/72	7	7.46286	6.67	6.67	8.89	0.824768
12/72	8	5.4875	5.56	4.44	6.11	-1.02305
1/73	7	0.714286	1.11	0.0	1.67	-0.0256633
2/73	4	4.445	4.445	3.33	5.56	1.69899E-15
3/73	7	6.27143	6.11	5.0	7.78	0.396838
4/73	13	5.21462	5.56	4.44	6.67	0.434423
5/73	13	16.4969	16.67	15.0	18.33	0.270471
6/73	13	25.0	25.56	22.22	27.78	-0.0828729
7/73	13	25.0446	25.56	21.67	28.89	0.0809485
8/73	13	19.0192	17.78	16.67	26.67	2.89061
10/73	13	12.8208	12.78	11.67	16.11	2.61247
11/73	12	13.8417	13.885	8.89	17.78	-0.885505
12/73	15	1.55533	1.67	1.11	2.22	0.668097
1/74	14	7.73857	7.78	7.22	9.44	3.52704
2/74	14	4.40429	3.89	2.22	8.89	1.92659
3/74	14	8.01643	7.78	6.67	9.44	-0.0705394
4/74	14	11.0307	11.11	6.67	14.44	-0.628307
5/74	15	20.0	20.0	18.33	22.22	0.800389
6/74	14	20.3171	20.0	16.67	24.44	0.776749
7/74	24	22.5692	22.22	18.89	26.67	1.16273
8/74	4	24.025	24.44	22.22	25.0	-1.4006
9/74	14	20.4371	20.56	18.89	23.89	1.49825
10/74	15	12.7407	12.78	10.0	16.11	0.605164
11/74	18	9.59944	10.0	6.11	12.78	-0.371237
12/74	15	4.186	3.89	1.11	6.67	-0.0216453
1/75	21	2.7519	2.22	0.56	5.56	0.79583
2/75	11	3.63818	3.89	1.67	6.67	1.05143
3/75	21	3.36	2.78	1.67	8.33	3.18542
4/75	12	11.39	10.835	6.67	15.0	-0.179853
5/75	20	21.6115	21.945	12.22	26.67	-1.86519
6/75	15	23.11	22.22	20.0	26.11	0.18347
7/75	11	23.2382	23.33	20.0	25.0	-2.15088
8/75	16	24.3544	25.0	8.0	28.33	-4.94846
9/75	18	20.5244	20.0	17.78	22.78	0.0761195
10/75	16	15.1056	15.56	9.44	17.22	-4.42616
11/75	17	9.80412	10.0	6.67	12.78	0.168194
12/75	15	5.22333	6.11	2.78	6.67	-1.03136
1/76	19	1.55211	0.56	0.0	6.11	3.04374
2/76	15	11.186	11.11	7.78	13.89	-0.963013
3/76	20	8.8145	8.89	4.5	12.22	-0.397174
4/76	20	18.4445	20.835	11.11	25.56	-0.572801
5/76	22	16.3991	15.78	12.22	20.56	0.425266
6/76	14	22.5986	22.775	17.5	25.56	-1.06962
7/76	19	24.6184	24.44	22.22	27.78	0.940497
8/76	18	23.3644	22.5	20.56	28.89	1.78201
9/76	24	18.4729	18.89	13.89	22.22	-0.657874
10/76	17	11.2106	10.56	8.89	14.44	1.1752
11/76	23	6.56435	6.11	2.78	10.0	0.137101
12/76	19	1.66737	1.67	0.0	2.78	-1.14802
2/77	9	1.66667	2.0	1.0	3.0	0.742307
3/77	20	9.1795	8.05	7.0	17.0	4.08984

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4/77	22	15.7736	16.24	10.0	20.0	-1.94425
5/77	14	16.8929	17.0	13.0	21.0	0.511063
6/77	25	22.7	23.0	16.0	26.0	-2.36087
7/77	20	24.75	24.5	21.0	31.0	2.06445
8/77	17	19.0353	25.0	1.9	28.5	-1.60189
9/77	17	6.12353	2.0	1.8	20.0	2.31564
10/77	17	7.72941	1.6	1.0	16.0	0.288608
11/77	21	2.9	1.0	0.3	9.0	2.02665
12/77	17	1.31176	0.6	0.1	6.0	4.22975
1/78	15	1.11333	1.0	0.0	6.2	4.92002
2/78	7	0.214286	0.1	0.0	0.5	0.966183
3/78	10	9.949	9.95	8.0	13.0	1.14466
4/78	26	10.1731	10.0	8.0	13.0	0.147549
5/78	25	18.04	17.5	13.5	27.0	1.568
6/78	22	23.7136	24.0	19.5	27.0	-0.875201
7/78	20	22.725	23.5	2.0	29.5	-6.04492
8/78	20	24.075	24.0	20.5	29.5	1.64658
9/78	21	23.9048	24.5	15.5	27.0	-4.0474
10/78	23	14.3391	16.0	8.0	18.0	-1.32127
11/78	19	7.89474	10.0	3.0	13.0	-0.249508
12/78	21	3.97619	4.0	2.0	6.0	0.829938
1/79	20	4.05	2.5	0.0	9.0	0.724562
3/79	23	8.50435	9.0	0.5	12.5	-1.86343
4/79	14	14.3786	15.1	8.0	18.2	-1.02481
5/79	21	18.6429	19.0	3.5	32.0	-0.693325
6/79	20	18.54	18.8	9.0	22.0	-4.59803
7/79	14	21.5714	21.7	18.8	24.6	0.254133
8/79	28	23.8857	23.75	20.0	28.5	0.679593
9/79	3	17.5	18.0	15.5	19.0	-0.814636
10/79	11	14.6364	14.0	11.5	19.3	0.983832
11/79	14	11.3571	12.0	7.0	13.5	-2.95864
12/79	10	1.78	1.6	0.5	3.5	0.594556
1/80	13	2.94615	3.7	0.0	5.0	-0.964965
2/80	11	1.18182	1.0	1.0	2.0	2.43676
3/80	13	6.17692	6.0	2.8	10.5	1.05586
4/80	7	13.6286	12.5	10.0	18.2	0.530278
5/80	11	19.0909	19.0	17.0	21.0	-0.138179
6/80	18	22.5333	22.5	21.0	23.5	-0.202192
7/80	5	23.08	23.1	19.9	26.5	0.197016
8/80	6	26.8667	27.0	25.0	28.2	-0.478001
9/80	1	21.0	21.0	21.0	21.0	
11/80	11	6.73636	6.6	4.3	8.8	-0.267447
12/80	11	4.08182	3.0	2.0	8.8	1.52939
1/81	2	0.9	0.9	0.0	1.8	
2/81	10	1.12	1.35	0.0	2.0	-0.680084
3/81	11	4.36364	4.3	3.5	5.7	0.644824
4/81	12	12.9742	13.4	9.69	15.0	-2.09123
5/81	11	15.4455	15.0	11.0	18.5	-0.320103
6/81	11	21.7909	23.0	16.5	25.5	-0.945797
7/81	11	26.2909	26.5	23.7	29.0	-0.281341
8/81	11	23.6455	23.7	22.0	26.0	0.735637
9/81	11	24.0636	24.5	22.0	26.0	-0.212216
10/81	11	15.6636	15.5	14.9	16.5	0.275601
11/81	11	11.5727	12.3	8.0	14.1	-1.07383
12/81	12	1.58333	1.0	0.2	7.0	3.46288
1/82	11	3.44545	3.0	2.1	5.8	1.83899
2/82	11	2.37273	1.0	0.7	7.2	1.7555
3/82	11	2.54545	2.5	2.0	3.0	-0.282999
4/82	11	10.2627	11.0	6.8	12.3	-1.69895
5/82	11	16.6818	18.5	1.0	20.0	-3.9483
6/82	11	15.7155	15.5	14.5	17.79	0.831727

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7/82	11	24.5909	24.8	21.0	27.3	-0.44829
9/82	11	17.0545	17.0	16.0	18.0	-0.32674
10/82	12	8.5775	6.89	4.99	20.0	2.66725
11/82	11	8.31818	8.5	6.5	10.0	-0.324639
12/82	11	1.16364	1.0	0.0	2.8	0.396837
1/83	3	1.2	1.1	0.3	2.2	0.329897
2/83	11	3.91818	5.0	0.3	6.5	-0.958585
3/83	11	7.0	7.2	5.5	8.4	-0.516077
4/83	14	10.55	10.5	7.5	15.2	1.33602
5/83	11	16.2818	16.5	13.3	18.6	-0.376463
6/83	12	19.7333	19.5	18.2	21.5	0.910671
7/83	11	22.2818	22.5	20.7	23.5	-0.733486
8/83	11	25.3182	25.6	22.9	27.0	-1.27296
9/83	11	22.4091	23.0	19.4	25.0	-1.08645
10/83	11	16.3636	16.0	15.5	17.5	0.99107
11/83	11	5.30909	5.3	3.9	6.5	0.0359162
12/83	11	7.38182	7.5	5.9	8.0	-1.39742
1/84	1	23.0	23.0	23.0	23.0	
2/84	11	3.82727	3.9	3.0	5.0	1.13521
3/84	11	3.86364	3.8	2.5	5.2	-0.103064
4/84	11	10.1545	10.2	9.0	11.0	-0.5921
5/84	12	13.975	13.75	13.0	16.0	1.25485
6/84	9	26.4	27.0	23.7	27.5	-1.84013
7/84	11	21.1364	21.0	19.0	23.0	0.200504
8/84	11	23.9091	23.5	22.0	27.5	1.93954
9/84	11	20.2636	20.2	18.0	21.0	-2.52599
10/84	9	12.6444	12.7	11.5	13.9	0.183606
1/85	8	0.3125	0.0	0.0	1.0	1.15315
2/85	11	2.59091	2.0	1.0	10.0	3.99315
3/85	10	8.67	8.5	7.2	10.0	0.20918
5/85	8	23.025	22.6	21.5	25.0	0.537473
6/85	9	21.4444	21.2	19.5	23.0	-0.242654
7/85	12	23.8167	23.65	22.0	26.0	0.739599
8/85	10	24.37	24.35	23.0	27.0	1.20063
9/85	10	20.32	20.25	18.5	23.0	0.439327
10/85	12	11.775	11.15	10.5	14.5	1.95771
11/85	10	14.2	14.5	13.0	15.5	-0.214955
12/85	11	3.71818	3.5	3.0	5.2	1.3182
1/86	10	0.5	0.25	0.0	2.5	2.81496
2/86	8	2.0625	1.5	1.0	5.0	1.61368
3/86	11	5.09091	5.0	3.7	6.5	0.127944
4/86	11	15.3182	14.5	14.0	18.0	1.67778
5/86	11	17.0273	18.0	13.2	18.5	-1.89282
6/86	9	23.4222	24.0	19.8	26.0	-0.964184
7/86	11	22.4273	22.5	20.0	26.5	0.860679
8/86	6	20.1667	20.0	18.0	23.5	1.11592
9/86	10	18.75	18.75	15.5	22.0	-0.0608581
10/86	10	12.36	12.25	11.0	13.5	-0.160844
11/86	1	6.0	6.0	6.0	6.0	
12/86	1	5.0	5.0	5.0	5.0	
1/87	0					
2/87	0					
3/87	1	7.0	7.0	7.0	7.0	
4/87	17	6.20588	6.0	5.2	7.0	0.02983
5/87	11	10.1818	10.0	9.0	11.5	0.288081
6/87	13	23.0308	23.3	18.2	26.0	-1.63361
7/87	8	26.9125	26.75	24.7	29.0	0.153547
8/87	8	25.9375	25.85	23.8	27.7	-0.255812
9/87	8	20.2625	20.35	17.5	22.3	-0.521424
10/87	8	11.8	11.85	9.3	13.7	-0.649917
11/87	8	8.1625	8.75	1.8	12.5	-0.798621

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12/87	8	5.8	6.0	3.8	7.0	-1.44827
1/88	5	0.24	0.2	0.1	0.4	0.287879
2/88	6	3.35	3.05	2.1	4.8	0.501465
3/88	6	6.81667	6.3	5.0	9.6	0.86977
4/88	8	12.6875	11.85	10.6	16.1	0.834113
5/88	6	18.3	18.0	16.9	20.1	0.690901
6/88	8	22.15	21.85	20.3	25.0	0.904768
7/88	8	23.1625	22.95	21.4	25.6	0.88133
8/88	8	24.4125	24.35	22.5	26.8	0.412102
9/88	8	18.8375	18.85	16.9	20.6	0.00994863
10/88	8	14.7875	16.65	9.4	19.0	-0.656233
11/88	8	10.4	10.3	6.5	14.5	-0.172957
12/88	5	4.56	4.3	3.6	6.3	1.4918
1/89	7	3.47143	3.5	2.2	4.8	0.199442
2/89	8	2.75	3.05	0.9	4.2	-0.355727
3/89	9	6.41111	6.4	1.6	12.3	0.656888
4/89	8	13.2125	14.05	8.9	15.8	-1.25529
5/89	8	15.375	15.35	12.6	18.8	0.656614
6/89	8	20.05	20.05	19.4	20.9	0.516735
7/89	6	26.1333	27.15	19.8	28.1	-2.35522
8/89	8	21.7	21.75	19.8	22.7	-1.15747
9/89	7	22.2143	23.0	17.9	23.6	-2.34458
10/89	4	14.0	13.95	12.8	15.3	0.216238
11/89	7	9.88571	9.8	7.0	12.8	0.00695899
12/89	5	1.3	1.6	0.0	3.2	0.399247
1/90	7	1.31429	1.0	0.0	3.5	0.586892
2/90	6	3.38333	3.55	1.7	5.7	0.354728
3/90	5	3.6	3.6	2.2	5.4	0.352561
4/90	5	8.88	8.7	8.4	9.5	0.450883
5/90	7	13.2714	13.4	11.4	15.4	0.227416
6/90	7	17.5571	18.4	15.0	19.5	-0.495561
7/90	7	23.2857	23.0	22.3	26.3	2.55119
8/90	8	20.8475	23.9	2.48	24.1	-3.18922
9/90	13	17.9538	16.7	13.8	24.5	0.90506
10/90	5	13.2	12.3	11.9	17.1	2.00104
11/90	4	6.025	6.1	5.3	6.6	-0.527862
12/90	3	4.26667	4.1	4.1	4.6	1.22474
1/91	17	3.72353	4.0	2.1	5.8	0.198735
2/91	0					
3/91	4	2.65	2.5	2.0	3.6	0.874756
4/91	13	12.5077	10.8	8.2	17.7	0.547625
5/91	9	21.2111	22.7	17.8	24.3	-0.25959
6/91	5	23.78	23.4	23.0	25.3	1.18923
7/91	6	24.6333	24.15	23.1	27.9	1.98828
8/91	5	23.18	24.4	17.8	25.2	-1.87885
9/91	4	17.95	17.95	17.3	18.6	1.15774E-14
10/91	5	11.96	11.6	10.8	14.0	0.845358
11/91	10	7.44	7.7	4.3	11.6	0.157274
12/91	5	5.4	5.1	4.5	6.9	0.836393
1/92	17	3.28824	3.5	0.5	6.2	-0.255511
2/92	10	2.08	1.65	1.1	4.0	1.38384
3/92	5	7.26	7.2	7.0	7.6	0.548968
4/92	19	10.7263	11.2	8.3	12.8	-1.07172
5/92	4	13.65	13.5	12.6	15.0	0.614689
6/92	5	18.42	18.2	17.3	19.6	0.18455
7/92	14	25.8286	26.05	21.8	27.7	-2.32446
8/92	10	21.22	21.0	20.3	22.2	0.393629
9/92	7	20.9429	21.0	19.3	21.9	-1.08925
10/92	14	10.0929	10.1	8.5	12.2	0.519041
11/92	10	9.44	10.2	6.5	11.8	-0.354549
12/92	5	5.1	5.1	3.7	6.3	-0.460067

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1/93	17	5.03529	5.2	1.1	8.6	-0.521008
2/93	10	1.28	1.05	0.7	3.2	3.02003
3/93	5	6.22	5.8	5.3	7.3	0.422275
4/93	14	11.5571	11.65	8.6	14.1	-0.267421
5/93	9	18.2778	18.2	17.5	19.4	0.596667
6/93	8	22.525	21.9	21.3	26.4	2.49265
7/93	14	25.6286	26.35	22.9	28.6	-0.297239
8/93	16	24.0312	23.85	22.5	27.9	3.08861
9/93	9	18.1333	18.0	17.3	19.3	0.732269
10/93	11	12.4364	12.3	10.5	15.7	1.07763
11/93	13	6.4	6.3	4.8	9.6	1.72915
1/94	14	1.75	1.3	0.8	4.3	2.43958
2/94	5	1.0	1.0	0.5	1.4	-0.322067
3/94	10	8.49	8.55	6.7	10.4	-0.0741608
4/94	13	13.9462	13.3	12.2	16.5	1.33857
5/94	10	14.37	14.55	12.5	15.4	-1.20207
6/94	6	24.25	24.05	23.1	26.0	0.970091
7/94	11	25.7727	25.7	24.4	27.3	0.449206
8/94	8	21.65	22.9	17.8	24.0	-0.987733
9/94	4	18.95	18.65	17.9	20.6	1.12437
10/94	12	11.375	11.4	8.9	14.1	0.253904
11/94	10	12.51	13.0	6.5	14.8	-2.61136
12/94	5	9.84	9.9	9.2	10.3	-0.758515
1/95	13	2.07692	1.9	0.3	4.1	0.411233
2/95	9	3.23333	4.0	1.5	4.5	-0.338487
3/95	5	5.58	5.2	4.9	6.4	0.457511
4/95	13	12.8231	12.6	9.7	15.8	0.091644
5/95	11	16.0364	17.9	11.8	19.3	-0.419115
6/95	4	18.85	18.9	18.1	19.5	-0.111969
7/95	13	24.1692	24.1	21.8	26.3	-0.0422173
8/95	12	23.7833	23.55	20.7	28.3	0.232585
9/95	7	21.2571	20.3	18.8	25.3	1.1554
10/95	12	15.4833	16.4	10.3	19.7	-0.626296
11/95	5	4.18	4.1	3.8	4.6	0.295263
12/95	5	4.64	4.4	4.0	5.7	1.17455
1/96	6	1.36667	1.4	0.3	2.6	0.0376116
2/96	11	2.92727	3.0	0.6	8.6	1.69942
3/96	10	7.74	7.6	6.5	10.9	2.77758
4/96	13	12.4846	10.6	8.3	19.1	1.30653
5/96	9	12.1889	12.4	11.2	14.1	1.04315
6/96	5	18.02	18.0	17.2	18.9	0.174733
7/96	13	23.3538	23.4	21.2	24.6	-1.57333
8/96	11	20.2364	21.1	18.3	22.4	-0.0951372
9/96	6	19.65	20.05	16.0	21.9	-1.30196
10/96	3	14.8667	14.8	14.4	15.4	0.41407
11/96	11	5.13636	4.9	3.9	7.5	2.012
12/96	10	6.62	6.7	5.3	8.0	-0.08425
1/97	5	6.08	5.9	5.1	7.3	0.397313
2/97	14	6.35	5.1	2.6	11.1	0.755676
3/97	11	9.67273	10.1	7.2	12.1	-0.102438
4/97	5	12.82	13.3	12.0	13.5	-0.505241
5/97	14	16.4643	15.9	12.9	19.6	0.71638
6/97	11	15.3545	15.4	14.1	16.7	0.127769
7/97	5	23.7	23.5	22.9	24.9	0.991993
8/97	10	21.67	21.8	20.2	22.7	-0.636867
9/97	13	18.7308	16.1	14.3	23.0	0.209475
10/97	7	17.3143	17.4	15.5	18.5	-0.71033
11/97	7	6.9	7.1	5.6	8.1	-0.26302
12/97	17	4.17647	4.6	1.4	7.0	-0.962908
1/98	5	4.36	4.5	3.7	5.1	-0.0281273
2/98	12	7.35	7.9	4.5	9.9	-1.05076

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3/98	10	6.05	6.4	4.2	7.9	-0.200132
4/98	5	17.58	17.5	15.3	19.5	-0.460585
5/98	8	19.5125	19.3	15.2	22.3	-0.546314
6/98	11	16.1455	16.0	14.4	17.6	0.0496018
7/98	11	25.5273	25.8	21.6	27.8	-1.41713
8/98	17	23.4882	23.7	21.2	25.6	-0.462556
9/98	2	23.25	23.25	22.6	23.9	
10/98	5	14.14	14.4	13.3	14.7	-0.902539
11/98	7	8.91429	9.4	6.9	10.6	-0.373433
12/98	11	5.27273	5.3	2.9	9.7	1.69539
1/99	34	0.208824	0.1	0.0	1.6	6.88231
2/99	56	4.69714	4.65	0.43	8.4	-0.608591
3/99	44	1.67273	1.6	0.0	4.2	1.24779
4/99	58	12.2931	11.8	9.5	14.7	0.838568
5/99	56	17.9554	18.1	15.9	19.9	-0.507311
6/99	26	23.7308	23.8	22.6	25.3	0.643575
7/99	105	22.0667	21.8	19.2	25.6	2.24843
8/99	45	21.6889	21.4	19.8	23.5	0.189936
9/99	80	18.7375	18.55	17.0	20.8	1.20823
10/99	45	12.7733	13.8	9.1	14.8	-1.82107
11/99	102	7.04412	7.3	3.8	9.6	-2.24196
12/99	90	2.00556	2.0	0.8	3.5	1.37056
1/00	60	2.69917	4.2	0.01	5.2	-0.977084
2/00	32	1.37969	1.3	0.05	2.8	0.366855
3/00	130	10.5885	10.7	7.0	14.0	-1.09008
4/00	55	13.3538	12.5	11.8	15.25	0.742152
5/00	135	16.4222	16.4	13.7	19.9	0.63884
6/00	59	20.5403	21.37	17.0	22.82	-1.80421
7/00	125	22.086	20.67	19.58	26.51	1.71573
8/00	60	22.765	21.225	19.94	26.5	1.49686
9/00	100	17.0515	17.185	14.17	20.9	0.959821
10/00	25	11.334	11.17	10.13	12.9	1.2161
11/00	40	6.8225	7.595	3.66	10.02	-0.434719
12/00	24	5.03917	4.94	4.0	6.86	1.65155
1/01	0					
2/01	0					
3/01	65	6.90462	7.18	4.78	8.87	-0.329412
4/01	54	8.64667	9.06	6.39	10.05	-2.20776
5/01	70	16.8686	16.69	13.98	19.41	-0.424299
6/01	55	21.02	21.24	18.76	22.9	-0.689769
8/01	35	21.6671	21.62	19.92	23.06	-0.363338
9/01	69	18.7433	18.42	16.5	22.13	1.14539
10/01	119	11.4847	10.75	8.26	17.33	4.49306
11/01	78	8.01846	7.26	4.42	14.0	2.24778
12/01	108	7.46278	7.165	6.0	12.29	9.02136
1/02	66	4.33455	4.23	2.79	5.76	0.333535
2/02	96	3.4575	2.255	0.14	9.09	3.31796
3/02	66	8.72727	8.67	7.98	10.19	3.34479
4/02	119	15.1692	14.2	11.95	21.9	5.79421
5/02	124	16.9283	17.37	12.05	20.99	-3.90689
6/02	114	22.0211	21.48	19.15	25.07	1.96379
7/02	78	23.69	24.21	20.47	26.33	-2.06401
10/02	22	11.3973	11.39	10.01	12.65	-0.164921
2/03	22	1.75545	1.31	0.56	4.1	2.20408
3/03	94	3.69053	3.89	0.72	8.22	0.613088
4/03	130	13.6892	13.79	10.42	15.99	-1.24146
5/03	11	13.3082	12.93	12.56	16.31	3.27558
6/03	124	18.4844	18.71	15.96	20.66	-0.589339
7/03	33	21.7045	21.38	20.13	25.41	3.0208
8/03	30	22.702	22.995	20.6	24.26	-1.26389
9/03	29	20.5859	20.68	18.18	22.17	-0.85792

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10/03	30	12.419	12.6	10.69	14.18	-0.0503537
11/03	15	10.086	9.95	9.7	11.05	2.38577
12/03	23	2.41478	1.77	1.45	4.9	2.63543
1/04	15	1.304	1.02	0.44	3.55	2.31966
2/04	24	3.1225	3.115	2.11	4.17	0.318547
3/04	15	7.196	7.58	4.72	8.88	-0.759532
4/04	24	9.41375	9.325	8.4	11.14	1.37655
5/04	18	18.0617	18.93	14.28	21.02	-0.809687
6/04	54	20.915	20.765	18.64	23.55	1.02196
7/04	57	22.5226	22.78	19.55	25.68	-0.189766
8/04	33	23.4264	22.99	22.18	25.91	1.86562
9/04	53	20.0911	19.94	18.24	22.07	0.487516
10/04	55	13.7836	12.89	10.59	18.73	1.79295
11/04	27	8.71333	7.34	5.79	14.84	2.70599
12/04	46	5.25196	6.23	-0.08	10.13	-0.0653173
1/05	48	4.78812	4.36	-0.06	10.95	0.148452
2/05	22	2.20409	2.58	-0.08	6.4	0.363108
3/05	61	4.82115	4.91	1.01	8.89	-0.286529
4/05	37	11.0957	10.25	7.75	17.07	1.9115
5/05	33	16.8033	17.48	13.87	18.91	-1.8248
6/05	40	20.4683	20.4	17.91	25.23	0.841895
7/05	73	24.6682	24.77	22.35	27.7	0.591723
8/05	9	26.63	27.5	24.27	28.12	-0.944546
9/05	66	20.8905	20.885	17.69	26.2	2.08579
10/05	18	10.435	8.55	7.74	18.4	2.87203
11/05	32	10.4478	10.08	8.11	12.43	-0.269772
12/05	16	2.81937	2.69	2.31	3.38	0.333363
1/06	54	5.97278	5.775	4.6	9.56	4.88713
2/06	14	4.755	4.22	2.45	9.18	1.3471
3/06	48	7.93125	6.75	5.3	14.9	3.32913
4/06	26	13.65	13.65	11.9	15.7	0.417858
5/06	59	15.8153	15.8	12.6	18.6	-0.160771
6/06	32	23.7094	23.1	21.6	27.5	2.86356
7/06	67	24.4731	24.6	21.7	26.9	-1.11805
8/06	46	25.0196	25.1	21.0	30.2	0.983747
9/06	31	18.9032	19.0	17.2	20.8	0.139374
10/06	21	14.1524	16.0	7.3	18.1	-2.08605
11/06	43	8.57442	8.0	7.4	10.6	2.44433
12/06	19	6.57368	6.4	4.3	10.1	0.91208
1/07	31	3.91613	1.3	0.4	10.7	1.80094
2/07	27	2.83333	3.0	0.3	5.0	-0.321597
3/07	31	6.88065	8.0	2.3	10.1	-1.3802
4/07	41	8.96341	8.1	6.0	13.8	2.40196
5/07	58	17.8741	17.7	13.8	21.6	-0.0565366
6/07	29	21.4966	21.3	18.8	26.2	1.73109
Total	8576	13.5471	13.895	-0.08	32.0	-2.60734

Section C) Surface Water Quality lab analyses. Summary statistics for 72 analytes sampled by DEQ at 142 sites in Loudoun County or contributing watersheds.

Summary Statistics for DEQ Surface Water Quality Data

Parameter Name	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
Field Turbidity (NTU)	1100	13.74	6.20	53.14	387%	0.83	1540	1539.17	3.93	10.8	6.87	307.61	4245.35
Specific Conductance (uS/cm)	1659	206.40	171.00	120.57	58%	31.1	1893	1861.9	135.2	235	99.8	61.1711	246.664
BOD 5 DAY (mg/L)	2981	2.39	2.00	2.57	107%	0.04	54	53.96	1	2	1	152.092	901.763
COD (mg/L)	2145	13.23	11.00	11.34	86%	0	181	181	7	16	9	121.035	694.854
pH (standard units)	1950	6.97	7.04	0.63	9%	0	10.28	10.28	6.69	7.39	0.7	-24.7585	100.659
Tot. Alkalinity as CaCO3 (mg/L)	1955	51.51	42.00	30.27	59%	0	321	321	30	66	36	28.409	40.4087
Total Residue (mg/L)	2101	153.22	127.00	102.37	67%	0	2167	2167	102	177	75	159.905	1316.31
Total Nitrogen (mg/L)	550	1.28	1.23	0.48	38%	0.18	3.21	3.03	0.92	1.56	0.64	5.43584	2.3604
NH3-N Total (mg/L)	4585	0.25	0.10	1.06	428%	0	22.5	22.5	0.04	0.1	0.06	299.447	2016.05
NO2-N Total (mg/L)	4120	0.06	0.01	0.49	830%	0	28	28	0.01	0.02	0.01	1225.59	34117
NO3-N Total (mg/L)	3541	1.18	0.95	1.27	107%	0	27	27	0.49	1.5	1.01	139.759	856.919
Total Kjeldahl N (mg/L)	4122	0.78	0.40	3.56	458%	0.01	183.9	183.89	0.3	0.6	0.3	978.755	23321.1
NO2 and NO3 N-TOTAL	1048	1.13	0.98	0.87	77%	0.02	9	8.98	0.55	1.5	0.95	34.7571	97.2044
Total Phosphorous (mg/L P)	3344	0.11	0.10	0.18	161%	0.01	4.8	4.79	0.05	0.1	0.05	311.426	2947.69
Dissolved PO4 (mg/L P)	1392	0.22	0.03	5.42	2510%	0	202	202	0.02	0.06	0.04	567.392	10578.9
Total Organic Carbon (mg/L)	2201	6.31	5.10	4.52	72%	0	62	62	3.66	8	4.34	75.8208	303.743
Total Hardness (mg/L CaCO3)	1804	72.98	60.50	41.00	56%	0.45	523	522.55	47	89.55	42.55	47.477	157.55
Dissolved Calcium (mg/L)	37	15.14	14.00	9.84	65%	1	45.6	44.6	9.6	16.8	7.2	3.03151	2.45617
Total Chloride (mg/L)	1567	17.64	11.50	22.06	125%	0	295	295	8.2	18.2	10	90.0417	347.711
Total SO4 (mg/L)	1487	15.95	14.30	8.57	54%	0	144	144	11.1	19	7.9	70.6968	383.347
Total Fluoride (mg/L)	399	0.18	0.12	0.13	72%	0.03	0.6	0.57	0.1	0.2	0.1	13.4323	6.61655
Dissolved Silica (mg/L)	511	12.52	12.60	3.80	30%	2.1	40	37.9	10.1	15	4.9	5.16463	21.8208
Dissolved Arsenic (ug/L)	29	0.75	0.21	1.48	198%	0.1	5	4.9	0.1	0.4	0.3	5.86973	6.24173
Total Arsenic (ug/L)	306	3.78	2.00	3.39	90%	0	11	11	1	5	4	7.96366	-1.47895
Total Cadmium (ug.L)	319	7.48	10.00	4.16	56%	0	32.99	32.99	2.5	10	7.5	-0.2731	10.9809
Dissolved Chromium (ug/L)	29	2.53	0.10	9.48	374%	0.1	50	49.9	0.1	0.18	0.08	10.6447	26.985
Total Chromium (ug/L)	392	11.40	10.00	10.23	90%	0	50	50	10	10	0	24.6907	37.3555
Total Copper (ug/L)	390	13.33	10.00	11.46	86%	0	99.99	99.99	10	10	0	29.1161	56.8657
Total Iron (ug/L)	132	484.00	350.00	380.48	79%	70	3010	2940	263.96	612.5	348.54	14.4879	35.9646
Dissolved Iron (ug/L)	29	197.76	100.00	370.14	187%	15	2030	2015	85	174	89	10.3262	25.6519
Dissolved Lead (ug/L)	29	0.61	0.10	1.52	250%	0.1	5	4.9	0.1	0.1	0	6.0425	6.55302
Total Lead (ug/L)	373	8.06	8.00	10.25	127%	0	164.9	164.9	3	10	7	80.6338	587.283
Total Manganese (ug/L)	136	87.74	60.00	87.44	100%	0.3	530	529.7	40	100	60	12.7353	20.4317
Dissolved Manganese (ug/L)	29	135.83	60.80	226.86	167%	0.1	1000	999.9	25	101	76	5.90753	8.16935
Dissolved Thallium (ug/L)	29	1.19	0.20	3.05	256%	0.1	10	9.9	0.2	0.2	0	6.04026	6.54921
Total Thallium (ug/L)	45	14.11	10.00	5.56	39%	1	20	19	10	20	10	-0.312529	-1.74543
Dissolved Nickel (ug/L)	215	75.34	99.99	41.70	55%	0	100	100	10	99.99	89.99	-6.65188	-2.25688
Total Nickel (ug/L)	142	25.56	10.00	27.43	107%	10	100	90	10	50	40	8.43159	4.75695

Summary Statistics for DEQ Surface Water Quality Data

ParameterName	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
Dissolved Zinc (ug/L)	29	4.62	1.19	10.32	223%	0.94	50	49.06	1	2.2	1.2	8.35923	16.2654
Total Zinc (ug/L)	391	19.39	10.00	24.01	124%	0	309.9	309.9	10	19.99	9.99	50.7301	244.589
Dissolved Antimony (ug/L)	29	1.22	0.10	3.04	248%	0.1	10	9.9	0.1	0.5	0.4	6.0073	6.49176
Dissolved Aluminum (ug/L)	26	2.93	3.32	1.73	59%	0.1	6.16	6.06	1.49	3.9	2.41	-0.309088	-0.497513
Dissolved Selenium (ug/L)	29	1.44	0.50	2.96	206%	0.1	10	9.9	0.5	0.5	0	6.02483	6.52359
Total Selenium (ug/L)	61	13.36	10.00	7.26	54%	1	23	22	10	20	10	-1.37287	-2.06226
Stream Flow Severity	1971	3.39	3.00	1.04	31%	0	9	9	3	5	2	11.3653	-2.8929
Total Coliform (MPN) ConfTube	118	8423.50	2400.00	14333.20	170%	30	110000	109970	430	11000	10570	16.5017	47.0399
Fecal Coliform MFM-FCBR /10	4101	1073.70	100.00	9819.86	915%	0	600000	600000	100	500	400	1457.55	44178.2
E. coli MTEC-MF NO/10	622	311.92	100.00	536.84	172%	10	4000	3990	25	300	275	34.2257	71.3658
Chlorophyl A (ug/L)	259	1.88	0.93	2.62	139%	0.5	20.96	20.46	0.5	2.14	1.64	25.8027	62.8279
Chlorophyl B (ug/L)	237	0.52	0.50	0.26	51%	0.5	4.54	4.04	0.5	0.5	0	95.3582	729.671
Chlorophyl C (ug/L)	237	0.50	0.50	0.03	6%	0.5	0.91	0.41	0.5	0.5	0	69.6162	398.82
Total Endosulfan (ug/L)	46	0.07	0.10	0.06	87%	0.01	0.2	0.19	0.01	0.1	0.09	1.62988	-0.344746
Total PCB 1016 (ug/L)	46	0.27	0.10	0.20	72%	0.1	0.5	0.4	0.1	0.5	0.4	0.894438	-2.686
2,4-DB Total (ug/L)	43	0.25	0.20	0.05	20%	0.2	0.3	0.1	0.2	0.3	0.1	0.129096	-2.80765
Total PCP (ug/L)	81	0.06	0.10	0.06	93%	0	0.2	0.2	0	0.1	0.1	0.804371	-1.51201
Total Aldrin (ug/L)	109	0.04	0.01	0.05	143%	0	0.2	0.2	0	0.1	0.1	5.29242	1.44452
Total Dieldrin (ug.L)	82	0.04	0.01	0.05	142%	0	0.2	0.2	0	0.1	0.1	4.78767	1.58565
Total Endrin (ug/L)	81	0.05	0.05	0.05	111%	0	0.2	0.2	0	0.1	0.1	3.6449	1.34909
Total Toxaphen (ug/L)	46	0.29	0.20	0.20	68%	0.1	0.5	0.4	0.1	0.5	0.4	0.387206	-2.81118
Total Heptachlor (ug/L)	46	0.07	0.10	0.06	87%	0.01	0.2	0.19	0.01	0.1	0.09	1.62988	-0.344746
PCB's Whole Sample (ug/L)	56	0.17	0.00	0.24	137%	0	0.5	0.5	0	0.5	0.5	2.0781	-2.40719
Atrazine Whole Sample (ug/L)	32	0.22	0.00	0.28	128%	0	1	1	0	0.5	0.5	2.33017	0.279815
2,4-D Whole Sample (ug/L)	43	0.25	0.20	0.05	20%	0.2	0.3	0.1	0.2	0.3	0.1	0.129096	-2.80765
2,4,5-T Whole Sample (ug/L)	43	0.15	0.20	0.05	33%	0.1	0.2	0.1	0.1	0.2	0.1	-0.129096	-2.80765
SILVEX Whole Sample (ug/L)	43	0.15	0.20	0.05	33%	0.1	0.2	0.1	0.1	0.2	0.1	-0.129096	-2.80765
Total Calcium Hardness (mg/L)	48	59.27	51.50	27.29	46%	11	166	155	42.125	72	29.875	4.74331	6.0684
Dissolved Residue @ 180°C (mg)	111	146.39	115.00	78.37	54%	59	454	395	98	181	83	8.2258	8.04593
Total PO4 (mg/L)	1317	0.23	0.10	0.73	309%	0.05	19.5	19.45	0.1	0.1	0	240.896	2870.41
Total Phosphorous (mg/L P)	2895	0.10	0.03	0.48	460%	0	17	17	0.02	0.08	0.06	433.357	6385.53
Dissolved Mercury (ug/L)	20	0.22	0.20	0.04	17%	0.2	0.3	0.1	0.2	0.2	0	3.87616	2.534
Total Mercury (ug/L)	367	0.49	0.50	0.55	113%	0	5	5	0.3	0.5	0.2	55.6551	209.205
TURBIDITY FIELD NTU	230	11.30	4.60	32.26	286%	0	440	440	2.7	9.7	7	67.0374	428.766

Section D) Twenty sites in Loudoun County and contributing watersheds were chosen for more detailed analysis based on the length of sampling record found at those sites. This section show statistics for those 20 sites by a subset of 13 major analytes

Summary Statistics for Specific Conductance (uS/cm).at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	51	164.555	154	52.1168	31.67%	79.4	312	232.6	132	186	54	3.1901	2.05092
1ALII003.97	45	159.004	141	61.3421	38.58%	78.8	367	288.2	119	178	59	4.1225	3.37779
1ASUG004.42	60	306.535	284	124.764	40.70%	144	818	674	235.4	330	94.6	6.79903	9.32663
1ABRB002.15	115	295.517	285	109.251	36.97%	63.5	849	785.5	228	351	123	5.8974	11.3095
1AHPR003.87	53	374.651	352	153.362	40.93%	181	958	777	282	381.3	99.3	5.4662	5.7724
1AGOO002.38	144	191.055	171	77.5904	40.61%	57.4	632	574.6	141	219	78	11.9384	22.0667
1ASYC002.03	57	200.358	208	37.9851	18.96%	68.5	260.8	192.3	177	224	47	-3.61318	2.85194
1ATUS000.37	66	383.758	380.5	120.385	31.37%	33.6	826	792.4	327	439	112	1.07762	4.5176
1ABEC004.76	56	168.846	167	26.2625	15.55%	98.9	228	129.1	152	186.5	34.5	0.226148	0.252395
1ANOG005.69	54	194.689	186.1	46.8682	24.07%	44.6	311	266.4	165	215	50	0.198365	2.01819
1ACRM001.20	53	119.383	120	13.894	11.64%	89	161	72	108.5	129	20.5	0.820142	0.770341
1AGOO022.44	137	145.883	140	26.3267	18.05%	58	244	186	127	168.5	41.5	1.68986	2.24933
1AGOO044.36	135	154.941	132	110.16	71.10%	59.6	986	926.4	110	166	56	26.761	85.3721
1ALIM001.16	35	215.326	230	60.1352	27.93%	70.9	308	237.1	172	262	90	-1.44073	-0.239581
1ACAX004.57	135	161.644	160	32.4891	20.10%	62.5	434	371.5	147.9	173	25.1	19.7633	87.244
1ANOC000.42	44	145.24	144.65	32.899	22.65%	41	235.6	194.6	127.00	164.50	37.50	-0.42	2.72
1ANOC004.38	12	181.617	169.5	35.4773	19.53%	141	260	119	156	205.7	49.7	1.60238	0.456631
1ASOC001.66	45	180.027	187	36.1957	20.11%	59	224.7	165.7	169	206	37	-4.1287	3.73403
1APIA001.80	51	100.739	99.9	17.8384	17.71%	59.2	162	102.8	88.4	109	20.6	2.45535	3.59345

Summary Statistics for Total Organic Carbon (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	24	5.27	4.30	2.664	50.59%	2.5	13.9	11.4	3.58	6.3	2.72	3.865	4.307
1ALII003.97	23	5.01	4.50	2.640	52.71%	1.6	12.3	10.7	3	6.2	3.2	2.633	1.971
1ASUG004.42	180	6.62	6.00	3.277	49.48%	0.5	19	18.5	4	8	4	5.674	3.413
1ABRB002.15	173	8.30	7.50	3.940	47.48%	2.4	36.2	33.8	5.81	10	4.19	14.579	39.014
1AHPR003.87	130	7.29	7.00	3.877	53.15%	0.5	26	25.5	4.7	9	4.3	7.302	9.470
1AGOO002.38	229	5.75	5.00	4.301	74.78%	0	37	37	3.3	7	3.7	23.920	69.463
1ASYC002.03	24	3.77	3.75	1.557	41.33%	1.7	8.3	6.6	2.695	4.55	1.855	1.906	1.679
1ATUS000.37	176	7.83	7.00	4.512	57.59%	0.5	36	35.5	5	9	4	15.813	40.175
1ABEC004.76	20	4.83	4.40	2.535	52.47%	1.13	10.7	9.57	3.35	5.75	2.4	1.680	0.904
1ANOG005.69	99	6.12	5.00	5.445	88.94%	1	53	52	4	7	3	27.501	115.666
1ACRM001.20	21	4.97	4.90	2.881	58.02%	1.19	14.9	13.71	3.3	5.6	2.3	3.955	6.190
1AGOO022.44	185	4.61	3.90	4.086	88.69%	0.5	37	36.5	2.7	5	2.3	25.006	79.207
1AGOO044.36	87	2.86	2.70	1.608	56.23%	0.2	11	10.8	1.8	3.4	1.6	7.088	13.083
1ALIM001.16	195	5.18	4.00	4.864	93.82%	0.5	60	59.5	3	6	3	44.063	237.936
1ACAX004.57	96	5.86	5.00	4.867	83.13%	0.01	37	36.99	3.5	7	3.5	15.179	40.527
1ASOC001.66	101	6.26	5.00	6.558	104.82%	1	62	61	3.60	7.00	3.40	26.452	108.279

Summary Statistics for Alkalinity (mg/L as CaCO₃) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	47	48.72	41.70	23.367	47.96%	15.8	117	101.2	31.5	62.8	31.3	3.124	1.546
1ALII003.97	45	43.01	39.30	18.107	42.10%	10.1	91.2	81.1	31.8	50.3	18.5	1.501	0.186
1ASUG004.42	107	61.82	65.20	19.213	31.08%	7.8	100	92.2	48.7	73	24.3	-1.461	-0.574
1ABRB002.15	160	75.94	71.15	37.930	49.95%	3.4	321	317.6	47.7	96.1	48.4	10.103	25.853
1AHPR003.87	88	83.76	86.10	29.115	34.76%	17.8	149	131.2	61.8	105	43.2	0.197	-0.936
1AGOO002.38	195	46.75	40.00	22.525	48.19%	7.6	135	127.4	31	55.3	24.3	8.427	6.560
1ASYC002.03	45	65.47	66.30	23.862	36.45%	17	107	90	45.5	86.8	41.3	-0.073	-1.420
1ATUS000.37	134	88.34	88.50	31.820	36.02%	1.34	163	161.66	69.8	108	38.2	-0.228	0.100
1ABEC004.76	41	40.73	38.40	15.666	38.46%	24	105	81	30	46.2	16.2	5.842	9.047
1ANOG005.69	54	42.91	41.25	15.946	37.16%	19.2	105	85.8	30.8	46.2	15.4	4.520	5.010
1ACRM001.20	41	26.93	26.20	8.914	33.10%	13.2	56.9	43.7	20.4	30.6	10.2	3.579	3.087
1AGOO022.44	162	31.78	30.00	9.596	30.19%	6.7	56	49.3	24.8	39	14.2	1.057	-1.363
1AGOO044.36	142	30.02	29.00	11.322	37.71%	10.1	83.7	73.6	21.8	37	15.2	8.117	13.006
1ALIM001.16	29	85.19	92.70	35.766	41.98%	16.8	142	125.2	51.9	108	56.1	-0.468	-1.260
1ACAX004.57	203	38.38	37.20	11.020	28.72%	5.7	70	64.3	30.5	46.5	16	1.010	-0.714
1ANOC000.42	52	34.68	31.85	12.674	36.55%	13.9	62	48.1	25.4	41.1	15.7	1.838	-0.724
1ANOC004.38	12	48.33	42.65	19.431	40.20%	27.5	97.4	69.9	34.7	58.15	23.45	2.165	2.055
1ASOC001.66	55	41.62	40.00	13.401	32.20%	14.7	72	57.3	31.2	54.4	23.2	0.527	-0.956
1APIA001.80	43	24.19	23.00	7.250	29.97%	11.9	39.7	27.8	17.8	29.9	12.1	1.267	-0.756

Summary Statistics for pH (standard units) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	46	6.90	7.00	0.626	9.07%	5.65	8.1	2.45	6.51	7.33	0.82	-0.989	-1.014
1ALII003.97	45	6.80	6.85	0.536	7.88%	5.68	7.58	1.9	6.5	7.21	0.71	-1.390	-0.915
1ASUG004.42	107	7.23	7.30	0.593	8.21%	5.7	10.28	4.58	7	7.56	0.56	1.940	13.688
1ABRB002.15	160	7.20	7.27	0.548	7.60%	5.64	8.38	2.74	6.94	7.6	0.66	-3.908	1.194
1AHPR003.87	88	7.40	7.52	0.592	8.01%	5.81	8.55	2.74	7.09	7.885	0.795	-3.603	1.487
1AGOO002.38	195	7.02	7.05	0.512	7.29%	5.68	8.24	2.56	6.79	7.34	0.55	-3.849	1.668
1ASYC002.03	45	7.07	7.32	0.698	9.87%	5.67	8.02	2.35	6.66	7.6	0.94	-2.085	-0.948
1ATUS000.37	135	7.35	7.50	0.759	10.34%	1	8.46	7.46	7.2	7.75	0.55	-22.611	85.556
1ABEC004.76	41	6.77	6.93	0.562	8.30%	5.69	7.89	2.2	6.52	7.19	0.67	-1.228	-0.646
1ANOG005.69	54	6.93	7.07	0.581	8.38%	5.7	8	2.3	6.7	7.32	0.62	-2.024	-0.176
1ACRM001.20	41	6.61	6.74	0.528	7.98%	5.53	7.54	2.01	6.45	6.98	0.53	-1.283	-0.835
1AGOO022.44	162	6.82	6.90	0.488	7.16%	5.56	7.71	2.15	6.61	7.13	0.52	-4.422	0.830
1AGOO044.36	143	6.82	6.89	0.516	7.56%	5.55	7.77	2.22	6.66	7.1	0.44	-3.409	0.642
1ALIM001.16	29	7.08	7.39	0.792	11.18%	5.68	8.15	2.47	6.33	7.72	1.39	-1.137	-1.336
1ACAX004.57	203	6.93	6.99	0.479	6.91%	5.6	8.1	2.5	6.7	7.2	0.5	-4.337	2.067
1ANOC000.42	52	6.86	6.90	0.589	8.58%	5.61	8.5	2.89	6.555	7.2	0.645	-0.069	0.964
1ANOC004.38	12	6.19	6.12	0.367	5.93%	5.66	7	1.34	5.99	6.275	0.285	1.589	0.950
1ASOC001.66	55	6.85	6.98	0.560	8.17%	5.68	7.74	2.06	6.59	7.27	0.68	-2.436	-0.328
1APIA001.80	43	6.55	6.73	0.521	7.95%	5.57	7.43	1.86	6.05	6.9	0.85	-1.686	-0.791

Summary Statistics for turbidity (NTU) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	32	8.40	5.05	11.648	138.64%	1.6	63	61.4	3.55	8.22	4.67	9.05	19.27
1ALII003.97	31	16.96	8.60	37.529	221.25%	1.93	208.5	206.57	4.50	12.10	7.60	10.92	27.79
1ASUG004.42	32	13.27	5.87	23.921	180.23%	3.07	110	106.93	4.09	9.20	5.11	8.26	14.21
1ABRB002.15	72	20.15	11.90	22.442	111.39%	3.59	155	151.41	7.89	25.85	17.97	12.98	32.62
1AHPR003.87	31	16.10	5.50	41.824	259.85%	2.06	235	232.94	3.50	8.20	4.70	11.61	30.97
1AGOO002.38	86	9.82	6.90	8.941	91.02%	1.36	57	55.64	4.65	11.60	6.95	10.48	19.00
1ASYC002.03	42	14.00	8.05	22.489	160.61%	1.68	142	140.32	5.60	11.00	5.40	12.77	35.22
1ATUS000.37	42	52.17	4.65	237.858	455.95%	1.1	1540	1538.9	3.30	10.30	7.00	16.58	52.92
1ABEC004.76	42	12.06	5.70	17.019	141.11%	1.37	83	81.63	3.34	11.70	8.36	7.47	11.32
1ANOG005.69	38	17.83	7.37	31.701	177.81%	0.83	168	167.17	4.90	14.70	9.80	9.39	18.71
1ACRM001.20	41	13.31	5.50	26.362	198.12%	1.6	155	153.4	3.60	10.80	7.20	11.58	28.65
1AGOO022.44	84	7.10	4.06	13.788	194.14%	1.26	120	118.74	2.46	6.15	3.70	26.06	103.90
1AGOO044.36	78	4.90	4.06	3.828	78.16%	0.98	20.4	19.42	2.33	6.20	3.87	7.54	9.37
1ALIM001.16	32	12.49	8.83	12.796	102.48%	1.8	61	59.2	4.60	14.20	9.61	5.88	8.19
1ACAX004.57	77	8.43	5.60	9.547	113.25%	1.31	58	56.69	4.22	8.69	4.47	13.70	29.50
1ANOC000.42	28	7.61	6.48	5.111	67.19%	1.5	22	20.5	4.35	8.95	4.60	3.54	2.70
1ANOC004.38	12	8.71	8.22	5.603	64.36%	1.83	17.4	15.57	3.43	13.70	10.27	0.48	-0.99
1ASOC001.66	31	27.94	7.20	80.746	288.99%	3.11	453	449.89	5.04	18.40	13.36	11.81	31.78
1APIA001.80	36	10.38	4.62	16.337	157.40%	1.3	81.7	80.4	3.65	8.35	4.71	7.96	13.58

Summary Statistics for Total Phosphorous (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	69	0.06	0.05	0.064	116.36%	0.01	0.52	0.51	0.03	0.05	0.02	19.99	70.06
1ALII003.97	69	0.06	0.05	0.068	114.27%	0.01	0.52	0.51	0.03	0.05	0.02	17.23	53.30
1ASUG004.42	189	0.08	0.05	0.099	117.46%	0.01	1.2	1.19	0.05	0.10	0.05	46.07	248.45
1ABRB002.15	238	0.08	0.05	0.058	72.19%	0.01	0.5	0.49	0.05	0.10	0.05	21.36	52.23
1AHPR003.87	163	0.11	0.10	0.164	148.31%	0.01	1.99	1.98	0.05	0.10	0.05	49.86	282.24
1AGOO002.38	273	0.10	0.05	0.132	131.66%	0.005	1.4	1.395	0.05	0.10	0.05	36.31	135.01
1ASYC002.03	57	0.07	0.05	0.048	69.32%	0.005	0.34	0.335	0.05	0.10	0.05	9.56	25.99
1ATUS000.37	173	0.20	0.10	0.298	149.30%	0.005	2	1.995	0.05	0.20	0.15	19.78	42.30
1ABEC004.76	74	0.06	0.05	0.050	84.63%	0.005	0.3	0.295	0.03	0.06	0.03	8.78	13.48
1ANOG005.69	150	0.14	0.10	0.148	102.37%	0.005	1.5	1.495	0.05	0.20	0.15	28.20	119.96
1ACRM001.20	53	0.07	0.05	0.063	86.52%	0.02	0.4	0.38	0.05	0.10	0.05	9.75	20.74
1AGOO022.44	244	0.08	0.05	0.056	72.67%	0.005	0.4	0.395	0.05	0.10	0.05	16.95	27.79
1AGOO030.75	24	0.04	0.04	0.033	76.97%	0.01	0.18	0.17	0.02	0.05	0.03	6.53	13.47
1AGOO044.36	173	0.08	0.05	0.274	333.50%	0.005	3.6	3.595	0.05	0.08	0.03	67.01	431.62
1ALIM001.16	55	0.05	0.05	0.036	70.17%	0.005	0.2	0.195	0.03	0.05	0.02	5.99	8.18
1ACAX004.57	263	0.08	0.05	0.087	103.40%	0.01	0.7	0.69	0.05	0.10	0.05	28.14	69.93
1ANOC004.38	12	0.06	0.05	0.029	50.36%	0.02	0.1	0.08	0.04	0.09	0.05	0.42	-0.87
1ASOC001.66	132	0.12	0.10	0.155	131.08%	0.005	1.3	1.295	0.05	0.10	0.05	26.29	87.75
1APIA001.80	71	0.06	0.05	0.057	100.68%	0.01	0.43	0.42	0.02	0.05	0.03	15.59	47.32

Summary Statistics for Nitrate (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	51	0.23	0.18	0.219	95.39%	0.02	0.73	0.71	0.02	0.38	0.36	2.35	-0.52
1ALII003.97	45	0.35	0.31	0.292	84.58%	0.02	1.33	1.31	0.12	0.52	0.40	3.28	2.20
1ASUG004.42	189	0.85	0.79	0.492	57.52%	0.07	2.97	2.9	0.50	1.10	0.60	7.33	7.82
1ABRB002.15	258	0.85	0.69	1.196	141.15%	0	11.46	11.46	0.27	1.04	0.77	37.17	132.27
1AHPR003.87	167	1.11	1.00	1.112	100.02%	0.02	11.2	11.18	0.41	1.57	1.16	25.58	106.69
1AGOO002.38	277	1.27	1.11	0.944	74.09%	0.02	8.17	8.15	0.75	1.50	0.75	23.12	66.72
1ASYC002.03	57	0.88	0.87	0.303	34.58%	0.04	1.5	1.46	0.72	1.07	0.35	-1.77	1.54
1ATUS000.37	242	2.98	2.12	2.561	86.08%	0.02	17.9	17.88	1.31	3.75	2.44	12.27	16.26
1ABEC004.76	55	0.80	0.69	0.547	68.09%	0.02	2.6	2.58	0.37	1.23	0.86	2.45	1.29
1ANOG005.69	201	1.65	1.60	0.852	51.73%	0.025	4.29	4.265	0.98	2.29	1.31	1.93	-0.41
1ACRM001.20	53	0.72	0.74	0.405	55.93%	0.02	1.68	1.66	0.50	0.93	0.43	0.67	-0.26
1AGOO022.44	266	0.83	0.81	0.548	66.21%	0.005	3	2.995	0.37	1.20	0.83	2.33	-0.44
1AGOO030.75	40	1.27	1.19	0.642	50.44%	0.15	3.7	3.55	0.89	1.57	0.68	3.32	5.21
1AGOO044.36	164	0.58	0.54	0.385	66.25%	0.02	1.9	1.88	0.31	0.81	0.50	4.49	2.41
1ALIM001.16	46	1.43	1.30	0.732	51.26%	0.28	4.38	4.1	0.97	1.78	0.81	4.00	6.35
1ACAX004.57	238	1.20	1.10	1.823	152.29%	0.02	27	26.98	0.54	1.58	1.04	76.17	537.98
1ANOC004.38	26	0.92	0.88	0.474	51.41%	0.12	2.2	2.08	0.62	1.19	0.57	1.31	0.78
1ASOC001.66	150	1.59	1.53	0.855	53.69%	0.025	3.6	3.575	1.00	2.25	1.25	1.18	-1.84
1APIA001.80	51	0.57	0.56	0.290	50.81%	0.02	1.4	1.38	0.36	0.74	0.38	2.28	1.16

Summary Statistics for Ammonia (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ASUG004.42	232	0.14	0.05	0.290	209.57%	0.02	2.53	2.51	0.04	0.10	0.06	30.73	92.73
1ABRB002.15	302	0.08	0.05	0.098	123.93%	0.02	1	0.98	0.04	0.09	0.05	38.36	138.69
1AHPR003.87	189	0.08	0.05	0.131	155.66%	0.02	1.19	1.17	0.04	0.06	0.02	32.18	113.02
1AGOO002.38	319	0.16	0.05	0.504	307.82%	0.02	5.5	5.48	0.02	0.10	0.08	58.40	265.40
1ASYC002.03	57	0.04	0.02	0.055	131.64%	0.02	0.38	0.36	0.02	0.04	0.02	15.00	42.24
1ATUS000.37	268	0.89	0.31	1.938	217.05%	0	22.5	22.5	0.10	0.80	0.71	43.76	203.76
1ABEC004.76	102	0.05	0.04	0.056	102.26%	0.02	0.4	0.38	0.02	0.05	0.03	13.33	29.89
1ANOG005.69	242	0.09	0.05	0.116	125.70%	0.005	1.1	1.095	0.05	0.10	0.05	30.27	98.15
1ACRM001.20	53	0.05	0.02	0.060	110.55%	0.02	0.35	0.33	0.02	0.07	0.05	9.48	18.78
1AGOO022.44	294	0.05	0.05	0.094	181.26%	0.02	1.4	1.38	0.02	0.05	0.03	78.14	523.67
1AGOO030.75	194	0.06	0.02	0.331	540.89%	0.005	4.62	4.615	0.02	0.05	0.03	77.55	535.75
1AGOO044.36	74	0.06	0.04	0.071	118.82%	0.02	0.4	0.38	0.02	0.05	0.03	12.06	23.92
1ALIM001.16	271	0.05	0.04	0.066	131.00%	0.02	0.7	0.68	0.02	0.05	0.03	43.33	176.85
1ACAX004.57	55	0.08	0.05	0.055	70.52%	0.02	0.3	0.28	0.05	0.10	0.05	5.95	6.54
1ANOC004.38	52	0.08	0.05	0.057	73.37%	0.02	0.3	0.28	0.05	0.10	0.05	5.97	6.42
1ASOC001.66	173	0.08	0.05	0.084	106.96%	0.02	0.5	0.48	0.05	0.08	0.03	16.43	27.56
1APIA001.80	65	0.03	0.02	0.025	78.04%	0.02	0.13	0.11	0.02	0.04	0.02	8.26	10.41

Summary Statistics for Chloride (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	46	9.96	9.15	4.331	43.48%	2.5	26	23.5	7.10	11.40	4.30	4.63	5.85
1ALII003.97	45	10.77	8.80	5.905	54.85%	3.7	26.3	22.6	6.30	13.70	7.40	3.01	0.61
1ASUG004.42	70	40.27	24.50	45.324	112.54%	9.7	295	285.3	19.80	40.40	20.60	12.29	26.57
1ABRB002.15	137	22.91	17.60	22.134	96.63%	3.8	193	189.2	13.10	23.70	10.60	22.55	69.03
1AHPR003.87	64	43.03	28.35	39.887	92.70%	3.8	221	217.2	20.00	48.80	28.80	8.05	11.29
1AGOO002.38	146	15.42	11.85	10.803	70.04%	5	69.4	64.4	8.70	18.30	9.60	12.64	19.07
1ASYC002.03	46	9.01	7.60	4.016	44.57%	4.7	25.6	20.9	6.80	9.50	2.70	5.83	7.80
1ATUS000.37	68	43.54	36.70	31.380	72.08%	5	191	186	25.30	55.85	30.55	7.67	12.94
1ABEC004.76	41	10.26	10.20	2.952	28.77%	5	16.8	11.8	8.20	11.60	3.40	0.80	-0.38
1ANOG005.69	41	13.22	12.40	5.213	39.43%	5	24.9	19.9	9.00	16.70	7.70	1.28	-0.76
1ACRM001.20	41	13.22	12.40	5.213	39.43%	5	24.9	19.9	9.00	16.70	7.70	1.28	-0.76
1AGOO022.44	139	11.97	10.80	4.442	37.12%	2.5	28.4	25.9	8.87	14.10	5.23	5.53	3.83
1AGOO044.36	130	15.97	10.25	27.833	174.33%	2.5	242	239.5	7.60	14.50	6.90	30.17	105.14
1ALIM001.16	29	5.35	5.50	1.612	30.12%	2.5	8.6	6.1	5.10	6.10	1.00	-0.82	0.17
1ACAX004.57	144	12.81	10.70	12.110	94.55%	5	120	115	9.00	13.05	4.05	35.15	139.31
1ANOC000.42	45	10.16	9.70	2.925	28.79%	5	17.5	12.5	7.80	12.40	4.60	1.21	-0.63
1ANOC004.38	12	13.93	13.65	3.999	28.70%	6.3	20.9	14.6	11.75	16.05	4.30	0.09	0.23
1ASOC001.66	47	15.11	14.60	5.592	37.01%	5	33.2	28.2	11.50	17.50	6.00	3.06	3.26
1APIA001.80	44	7.63	5.95	8.707	114.20%	2.5	62	59.5	5.00	8.20	3.20	15.98	50.73

Summary Statistics for Sulfate (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	46	13.53	12.35	6.316	46.68%	5	41.1	36.1	10.00	15.30	5.30	6.01	10.24
1ALII003.97	45	14.50	12.50	10.433	71.93%	2.9	53.1	50.2	9.30	16.40	7.10	5.93	6.97
1ASUG004.42	66	20.55	19.35	16.006	77.89%	3.54	144	140.46	16.70	21.70	5.00	24.00	93.87
1ABRB002.15	120	22.53	22.40	7.383	32.78%	6.6	46.7	40.1	17.75	27.25	9.50	2.27	2.34
1AHPR003.87	62	24.06	23.15	8.715	36.22%	7.8	64.9	57.1	20.20	26.40	6.20	6.29	12.58
1AGOO002.38	141	15.91	14.70	6.360	39.98%	1.5	61.1	59.6	12.80	16.60	3.80	16.29	46.13
1ASYC002.03	46	11.55	11.20	3.909	33.85%	5	20.4	15.4	7.70	14.10	6.40	0.45	-1.06
1ATUS000.37	64	24.95	23.15	11.269	45.16%	5	89.8	84.8	19.10	27.80	8.70	10.19	27.62
1ABEC004.76	41	15.05	15.90	4.079	27.11%	5.5	21.8	16.3	13.20	17.40	4.20	-1.74	0.24
1ANOG005.69	40	17.99	17.85	4.776	26.55%	5	32.9	27.9	16.30	19.55	3.25	0.16	4.25
1ACRM001.20	42	10.78	11.35	2.462	22.84%	5	15.7	10.7	8.70	12.50	3.80	-0.56	-0.82
1AGOO022.44	138	12.88	12.40	4.108	31.90%	5.2	34.2	29	10.70	14.30	3.60	11.77	23.05
1AGOO044.36	130	12.95	10.95	10.434	80.57%	3.1	112.1	109	9.80	12.60	2.80	33.52	149.89
1ALIM001.16	29	9.95	10.40	3.945	39.64%	2.5	16.6	14.1	6.80	12.70	5.90	0.18	-1.01
1ACAX004.57	139	15.43	15.10	4.755	30.81%	2.5	38.8	36.3	12.80	17.30	4.50	8.66	17.24
1ANOC000.42	44	12.85	12.75	3.439	26.77%	5	22.9	17.9	10.90	14.70	3.80	1.60	2.09
1ANOC004.38	12	12.38	12.85	4.137	33.41%	6.4	21.9	15.5	9.40	14.35	4.95	1.09	1.07
1ASOC001.66	12	12.38	12.85	4.137	33.41%	6.4	21.9	15.5	9.40	14.35	4.95	1.09	1.07
1APIA001.80	44	10.00	10.05	4.772	47.74%	4.5	35.4	30.9	7.15	11.40	4.25	9.62	25.16

Summary Statistics for Fluoride (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	10	0.10	0.05	0.073	74.95%	0.025	0.25	0.225	0.05	0.15	0.10	1.41	0.25
1ALII003.97	9	0.09	0.05	0.074	81.82%	0.025	0.25	0.225	0.05	0.14	0.09	1.82	0.99
1ASUG004.42	32	0.13	0.15	0.060	47.44%	0.025	0.23	0.205	0.05	0.16	0.11	-0.21	-1.20
1ABRB002.15	29	0.13	0.13	0.074	58.67%	0.05	0.25	0.2	0.05	0.19	0.14	0.59	-1.59
1AHPR003.87	26	0.17	0.15	0.114	68.77%	0.04	0.6	0.56	0.10	0.18	0.08	4.80	8.08
1AGOO002.38	48	0.14	0.12	0.112	82.07%	0.025	0.57	0.545	0.05	0.16	0.11	5.41	6.30
1ASYC002.03	48	0.14	0.12	0.112	82.07%	0.025	0.57	0.545	0.05	0.16	0.11	5.41	6.30
1ATUS000.37	9	0.08	0.05	0.050	63.51%	0.025	0.15	0.125	0.05	0.13	0.08	0.97	-0.89
1ABEC004.76	31	0.30	0.29	0.130	43.95%	0.05	0.52	0.47	0.19	0.38	0.19	0.93	-0.84
1ANOG005.69	7	0.12	0.05	0.095	78.91%	0.05	0.25	0.2	0.05	0.25	0.20	0.90	-0.82
1ACRM001.20	8	0.13	0.08	0.093	73.31%	0.05	0.25	0.2	0.05	0.23	0.18	0.64	-1.17
1AGOO022.44	7	0.12	0.05	0.094	79.63%	0.05	0.25	0.2	0.05	0.25	0.20	0.97	-0.74
1AGOO044.36	45	0.10	0.05	0.065	68.52%	0.025	0.29	0.265	0.05	0.12	0.07	4.01	2.15
1ACAX004.57	42	0.09	0.05	0.062	67.85%	0.025	0.25	0.225	0.05	0.13	0.08	3.41	1.35
1ANOC000.42	48	0.10	0.08	0.076	72.72%	0.025	0.43	0.405	0.05	0.14	0.09	5.96	8.98
1ASOC001.66	8	0.10	0.08	0.051	53.97%	0.05	0.16	0.11	0.05	0.15	0.10	0.40	-1.32
1APIA001.80	9	0.09	0.05	0.052	60.05%	0.025	0.15	0.125	0.05	0.15	0.10	0.52	-1.18

Summary Statistics for Biochemical Oxygen Demand (mg/L) at DEQ stations with long records.

	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	46	1.86	1.00	1.773	95.37%	0.5	11	10.5	1.00	2.00	1.00	9.52	21.38
1ALII003.97	45	1.47	1.00	0.566	38.53%	0.5	3	2.5	1.00	2.00	1.00	1.53	-0.80
1ASUG004.42	203	2.03	2.00	1.477	72.70%	0.5	11	10.5	1.00	2.00	1.00	15.41	30.82
1ABRB002.15	228	2.78	2.00	3.223	115.97%	0.5	28	27.5	1.00	3.00	2.00	30.86	94.57
1AHPR003.87	157	2.10	2.00	1.982	94.50%	0.5	22	21.5	1.00	2.00	1.00	35.40	168.49
1AGOO002.38	286	2.38	2.00	2.389	100.37%	0.5	17	16.5	1.00	3.00	2.00	25.06	54.41
1ASYC002.03	46	1.70	1.45	1.141	66.95%	0.5	7	6.5	1.00	2.00	1.00	6.73	12.99
1ATUS000.37	214	3.81	3.00	2.952	77.43%	0.5	24	23.5	2.00	5.00	3.00	16.20	35.80
1ABEC004.76	43	1.83	1.20	1.407	76.67%	0.5	8.3	7.8	1.00	2.00	1.00	7.21	13.12
1ANOG005.69	123	2.10	2.00	2.224	106.02%	0.5	21	20.5	1.00	2.00	1.00	28.08	106.73
1ACRM001.20	42	1.88	1.85	1.209	64.45%	0.5	6	5.5	1.00	2.00	1.00	4.70	4.18
1AGOO022.44	240	1.62	1.00	1.552	95.97%	0.5	14	13.5	1.00	2.00	1.00	32.75	103.92
1AGOO044.36	145	1.56	1.00	2.020	129.20%	0.5	21	20.5	1.00	2.00	1.00	35.90	158.05
1ALIM001.16	30	1.95	1.50	1.315	67.45%	0.5	5	4.5	1.00	2.00	1.00	2.98	0.97
1ACAX004.57	251	1.73	1.00	1.973	114.15%	0.5	25	24.5	1.00	2.00	1.00	50.47	264.62
1ANOC000.42	116	2.13	2.00	2.177	102.38%	0.04	14	13.96	1.00	2.00	1.00	16.03	32.90
1ANOC004.38	13	1.62	1.00	0.768	47.54%	1	3	2	1.00	2.00	1.00	1.25	-0.43
1ASOC001.66	123	2.17	2.00	2.893	133.14%	0.5	27	26.5	1.00	2.00	1.00	27.58	104.58
1APIA001.80	44	1.50	1.00	0.833	55.35%	0.5	4	3.5	1.00	2.00	1.00	3.80	2.81

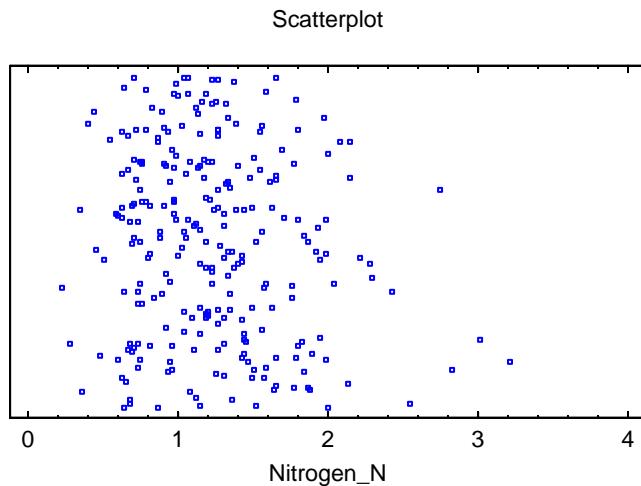
Summary statistics for Chemical Oxygen Demand (mg/L) at DEQ stations with long records.

Site ID	Count	Mean	Median	Standard deviation	Coeff. of variation	Minimum	Maximum	Range	Lower quartile	Upper quartile	Interquartile range	Stnd. skewness	Stnd. kurtosis
1ABUL025.94	33	14.67	12.00	7.45	0.51	6	37	31	10	18	8	2.933	1.699
1ALII003.97	32	14.29	11.55	9.70	0.68	5.2	51	45.8	8.6	16	7.4	6.150	9.102
1ASUG004.42	151	13.33	11.00	7.95	0.60	2	53	51	8.1	16	7.9	8.005	10.150
1ABRB002.15	192	19.44	17.00	15.74	0.81	0	180	180	13.25	22.9	9.65	40.891	188.123
1AHPR003.87	145	16.00	15.00	8.28	0.52	0.25	53	52.75	10.2	20	9.8	5.514	5.685
1AGOO002.38	217	12.06	11.00	9.13	0.76	0.5	108	107.5	7	15	8	34.456	169.313
1ASYC002.03	33	11.37	9.20	6.48	0.57	1.9	29	27.1	7.4	13.2	5.8	2.619	1.067
1ATUS000.37	149	17.49	16.00	10.93	0.62	0	91	91	12	22	10	12.348	33.784
1ABEC004.76	28	13.35	12.00	8.07	0.60	2.5	40.2	37.7	9	14.5	5.5	3.983	4.575
1ANOG005.69	106	12.75	11.00	13.29	1.04	0.5	131	130.5	8	14	6	29.502	127.568
1ACRM001.20	30	13.62	12.25	6.83	0.50	2.5	35	32.5	9.3	16.7	7.4	2.787	2.506
1AGOO022.44	207	9.52	8.00	8.49	0.89	0.5	75	74.5	5	11	6	27.841	97.845
1AGOO044.36	118	8.12	7.00	6.45	0.79	0.5	41	40.5	4.5	10	5.5	12.255	22.839
1ALIM001.16	211	11.27	9.40	13.52	1.20	0.5	181	180.5	6	13	7	57.282	352.684
1ACAX004.57	105	12.80	10.00	11.33	0.89	0.04	91	90.96	7	15	8	17.090	50.240
1ASOC001.66	110	12.43	9.50	16.41	1.32	0.5	164	163.5	6.1	15	8.9	31.990	145.199

Section E) Statistical and graphical analysis of individual analytes for all sites with long records.

1) One-Variable Analysis - Nitrogen_N (mg/L)

Data variable: Nitrogen_N
255 values ranging from 0.22 to 3.21



Summary Statistics for Nitrogen_N (mg/L)

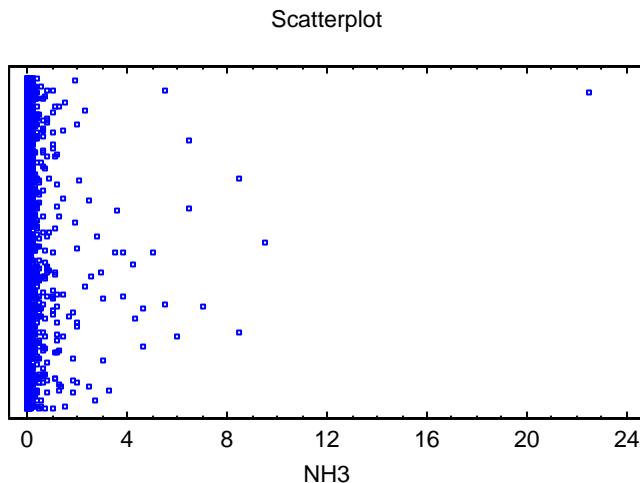
Count	255
Average	1.22984
Median	1.18
Standard deviation	0.494337
Coeff. of variation	40.1951%
Minimum	0.22
Maximum	3.21
Range	2.99
Lower quartile	0.86
Upper quartile	1.51
Interquartile range	0.65
Stnd. skewness	5.56736
Stnd. kurtosis	4.08905

Percentiles for Nitrogen_N

	<i>Percentiles</i>
1.0%	0.35
5.0%	0.6
10.0%	0.68
25.0%	0.86
50.0%	1.18
75.0%	1.51
90.0%	1.88
95.0%	2.08
99.0%	2.83

2) One-Variable Analysis - NH3 (mg/L)

Data variable: NH3
2957 values ranging from 0.0 to 22.5



Summary Statistics for NH3

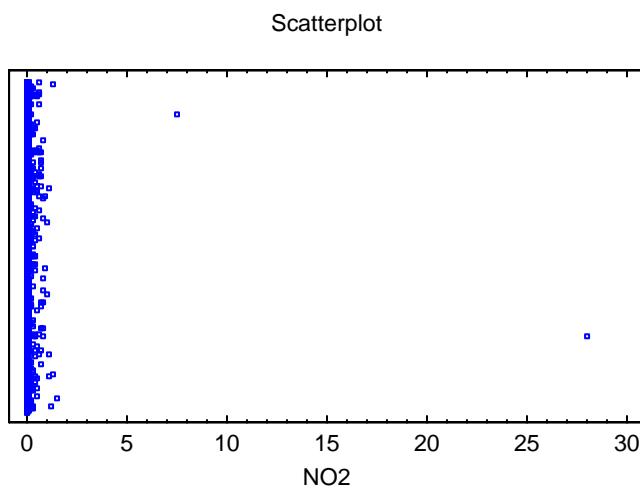
Count	2957
Average	0.157276
Median	0.05
Standard deviation	0.663862
Coeff. of variation	422.1%
Minimum	0.0
Maximum	22.5
Range	22.5
Lower quartile	0.02
Upper quartile	0.09
Interquartile range	0.07
Stnd. skewness	395.157
Stnd. kurtosis	5351.07

The StatAdvisor

This table shows summary statistics for NH3. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

3) One-Variable Analysis - NO2 (mg/L)

Data variable: NO2
2784 values ranging from 0.0 to 28.0

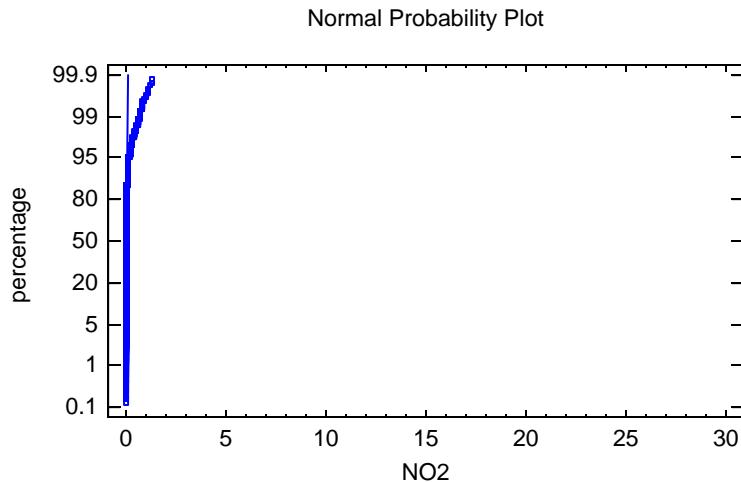


Summary Statistics for NO2

Count	2784
Average	0.0545366
Median	0.01
Standard deviation	0.5603
Coeff. of variation	1027.38%
Minimum	0.0
Maximum	28.0
Range	28.0
Lower quartile	0.005
Upper quartile	0.03
Interquartile range	0.025
Stnd. skewness	980.269
Stnd. kurtosis	24089.6

The StatAdvisor

This table shows summary statistics for NO2. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

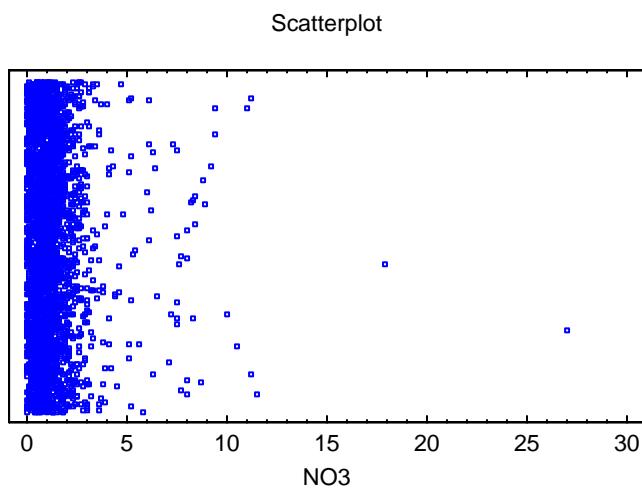


Percentiles for NO2

	<i>Percentiles</i>
1.0%	0.005
5.0%	0.005
10.0%	0.005
25.0%	0.005
50.0%	0.01
75.0%	0.03
90.0%	0.07
95.0%	0.17
99.0%	0.7

4) One-Variable Analysis - NO3 (mg/L)

Data variable: NO3
2576 values ranging from 0.0 to 27.0

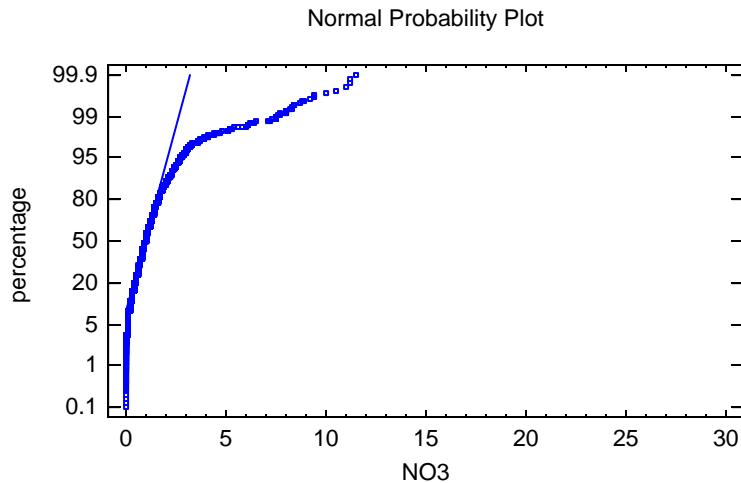


Summary Statistics for NO3

Count	2576
Average	1.21822
Median	0.96
Standard deviation	1.36392
Coeff. of variation	111.96%
Minimum	0.0
Maximum	27.0
Range	27.0
Lower quartile	0.5
Upper quartile	1.5
Interquartile range	1.0
Stnd. skewness	122.371
Stnd. kurtosis	722.174

The StatAdvisor

This table shows summary statistics for NO3. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

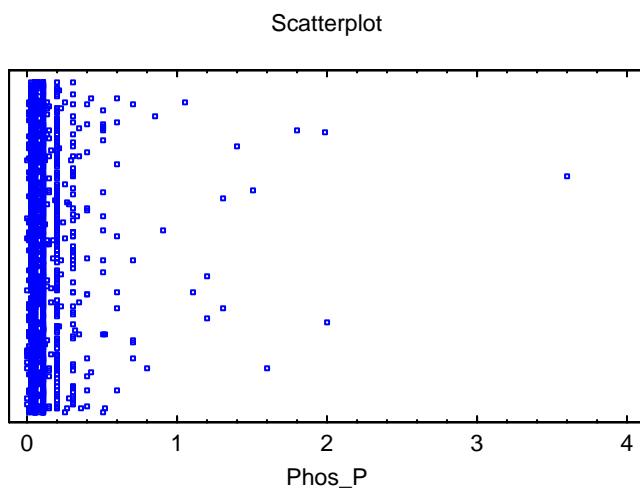


Percentiles for NO3

	<i>Percentiles</i>
1.0%	0.02
5.0%	0.05
10.0%	0.16
25.0%	0.5
50.0%	0.96
75.0%	1.5
90.0%	2.3
95.0%	2.97
99.0%	7.64

5) One-Variable Analysis – Total Phosphorous (mg/L)

Data variable: Phos_P
2482 values ranging from 0.005 to 3.6

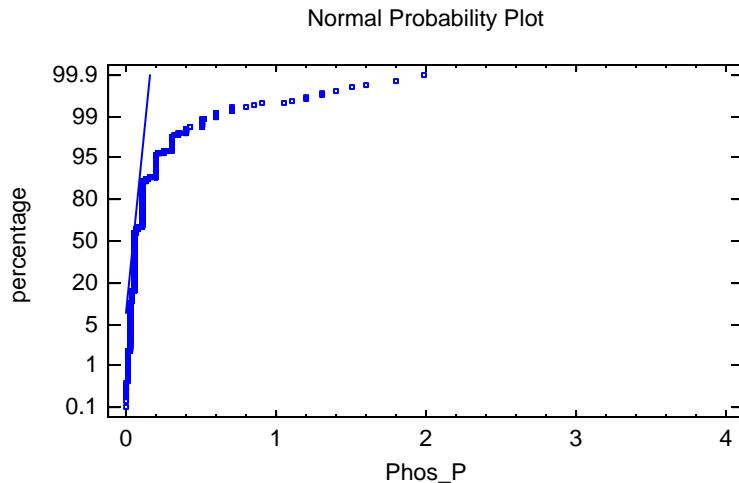


Summary Statistics for Phos_P

Count	2482
Average	0.0950657
Median	0.05
Standard deviation	0.147142
Coeff. of variation	154.779%
Minimum	0.005
Maximum	3.6
Range	3.595
Lower quartile	0.05
Upper quartile	0.1
Interquartile range	0.05
Stnd. skewness	215.094
Stnd. kurtosis	1803.34

The StatAdvisor

This table shows summary statistics for Phos_P. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

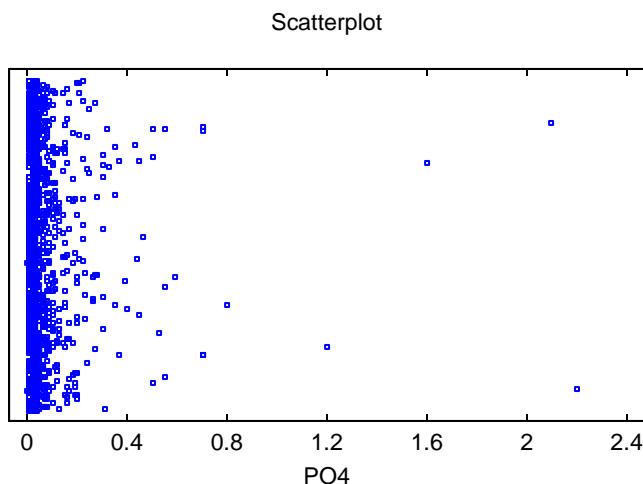


Percentiles for Phos_P

	<i>Percentiles</i>
1.0%	0.01
5.0%	0.02
10.0%	0.03
25.0%	0.05
50.0%	0.05
75.0%	0.1
90.0%	0.2
95.0%	0.24
99.0%	0.6

6) One-Variable Analysis - PO4 (mg/L)

Data variable: PO4
1217 values ranging from 0.0 to 2.2

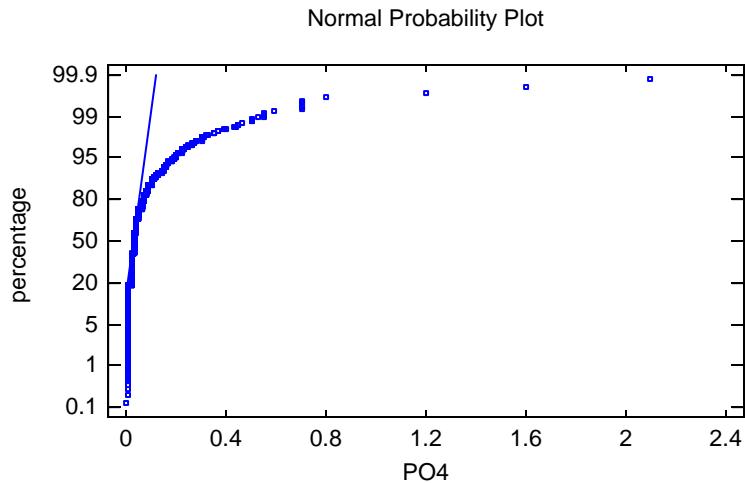


Summary Statistics for PO4

Count	1217
Average	0.0637839
Median	0.03
Standard deviation	0.13264
Coeff. of variation	207.952%
Minimum	0.0
Maximum	2.2
Range	2.2
Lower quartile	0.02
Upper quartile	0.06
Interquartile range	0.04
Stnd. skewness	132.33
Stnd. kurtosis	869.199

The StatAdvisor

This table shows summary statistics for PO4. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

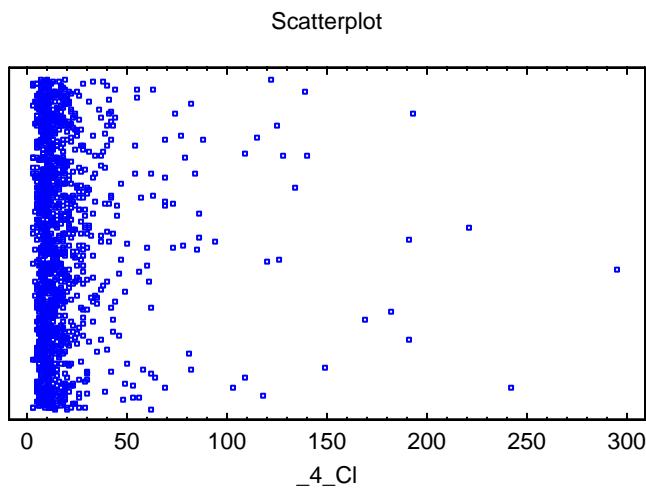


Percentiles for PO4

	<i>Percentiles</i>
1.0%	0.005
5.0%	0.005
10.0%	0.01
25.0%	0.02
50.0%	0.03
75.0%	0.06
90.0%	0.14
95.0%	0.22
99.0%	0.55

7) One-Variable Analysis - Chloride (mg/L)

Data variable: Cl
1336 values ranging from 2.5 to 295.0

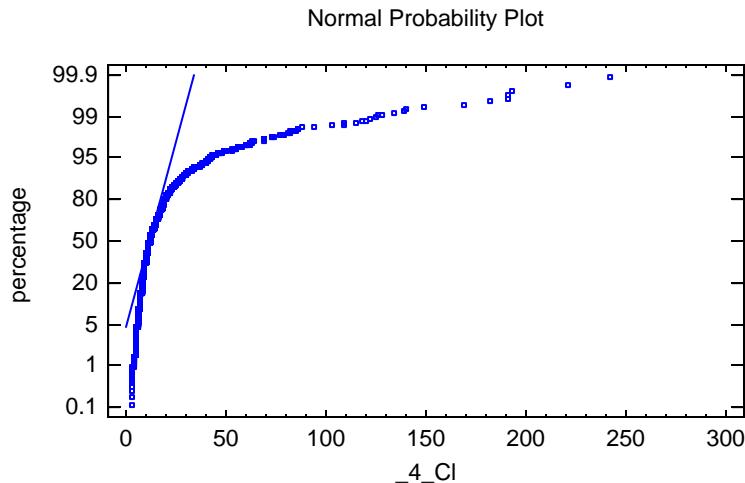


Summary Statistics for Cl

Count	1336
Average	17.9484
Median	11.6
Standard deviation	22.6946
Coeff. of variation	126.444%
Minimum	2.5
Maximum	295.0
Range	292.5
Lower quartile	8.5
Upper quartile	18.4
Interquartile range	9.9
Stnd. skewness	84.3242
Stnd. kurtosis	324.556

The StatAdvisor

This table shows summary statistics for Cl. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.



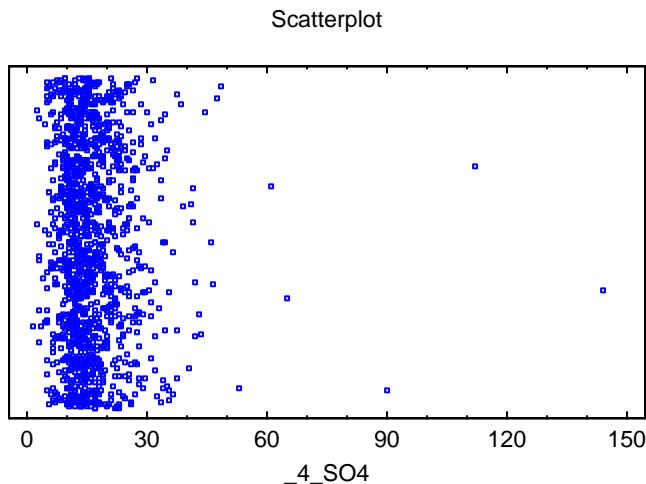
Percentiles for Cl

	<i>Percentiles</i>
1.0%	3.5
5.0%	5.2
10.0%	6.3
25.0%	8.5
50.0%	11.6
75.0%	18.4
90.0%	30.5
95.0%	48.1
99.0%	126.0

8) One-Variable Analysis - SO4 (mg/L)

Data variable: SO4

1295 values ranging from 1.5 to 144.0

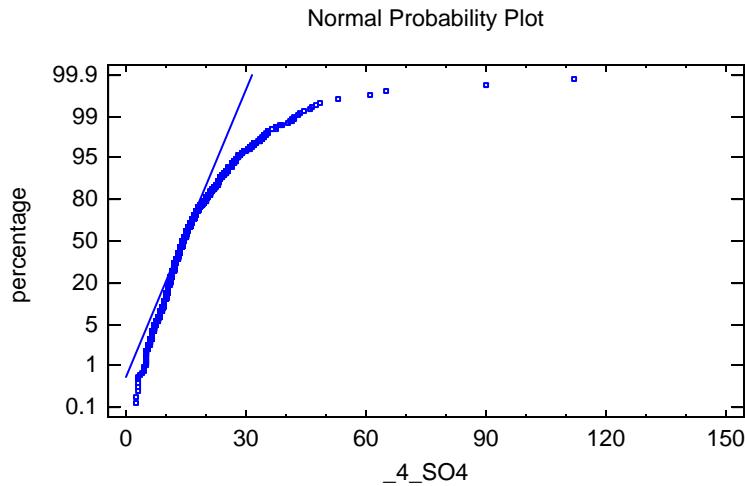


Summary Statistics for SO4

Count	1295
Average	16.0583
Median	14.3
Standard deviation	8.67813
Coeff. of variation	54.0416%
Minimum	1.5
Maximum	144.0
Range	142.5
Lower quartile	11.3
Upper quartile	18.9
Interquartile range	7.6
Stnd. skewness	71.7196
Stnd. kurtosis	389.713

The StatAdvisor

This table shows summary statistics for SO4. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

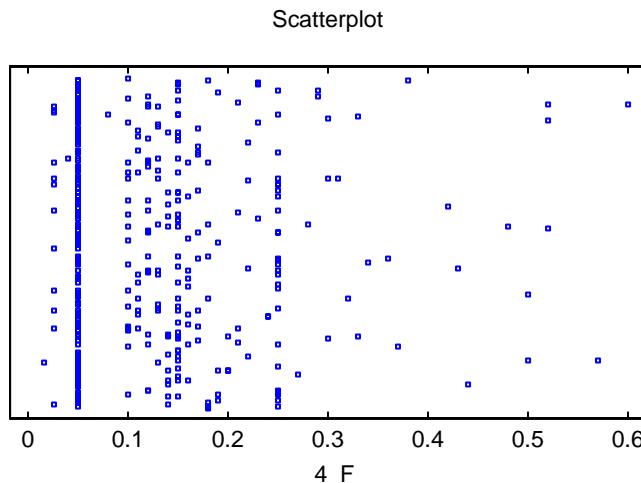


Percentiles for SO4

	<i>Percentiles</i>
1.0%	4.7
5.0%	6.8
10.0%	8.8
25.0%	11.3
50.0%	14.3
75.0%	18.9
90.0%	25.1
95.0%	29.2
99.0%	43.2

9) One-Variable Analysis - Fluoride (mg/L)

Data variable: F
376 values ranging from 0.015 to 0.6

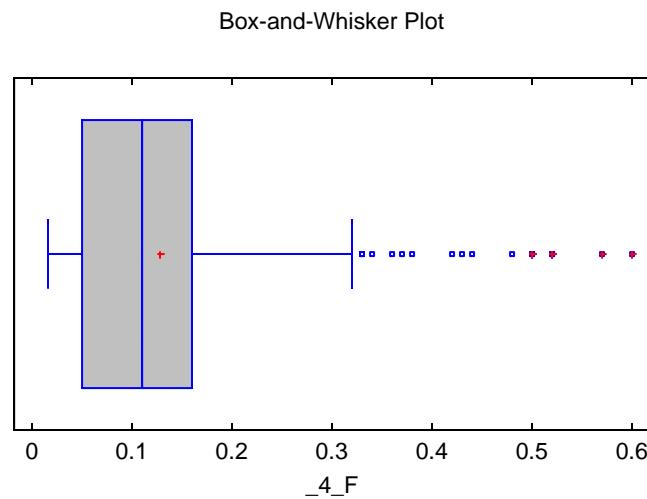


Summary Statistics for F

Count	376
Average	0.128816
Median	0.11
Standard deviation	0.100914
Coeff. of variation	78.3397%
Minimum	0.015
Maximum	0.6
Range	0.585
Lower quartile	0.05
Upper quartile	0.16
Interquartile range	0.11
Stnd. skewness	14.1248
Stnd. kurtosis	16.2402

The StatAdvisor

This table shows summary statistics for F. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.



Percentiles for F

	<i>Percentiles</i>
1.0%	0.025
5.0%	0.05
10.0%	0.05
25.0%	0.05
50.0%	0.11
75.0%	0.16
90.0%	0.25
95.0%	0.31
99.0%	0.52

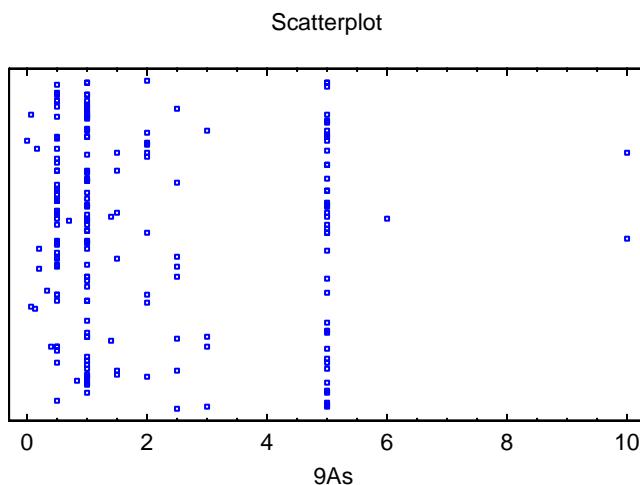
10) One-Variable Analysis - Arsenic (ug/L)

Data variable: _9As

186 values ranging from 0.0 to 10.0

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

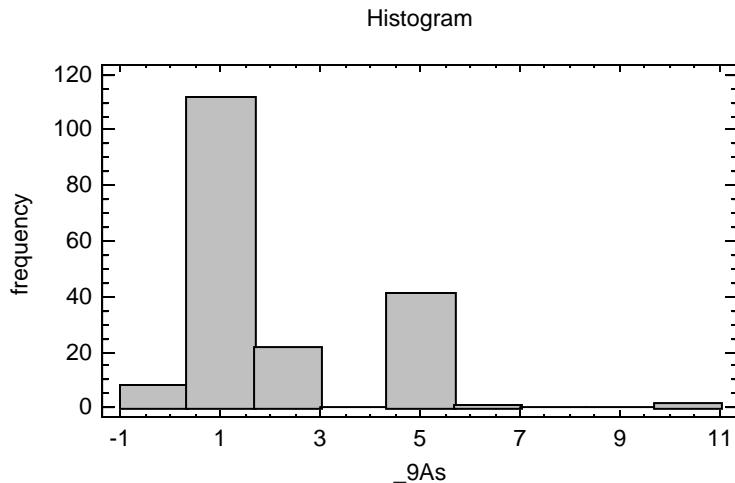


Summary Statistics for As

Count	186
Average	2.02898
Median	1.0
Standard deviation	1.95772
Coeff. of variation	96.488%
Minimum	0.0
Maximum	10.0
Range	10.0
Lower quartile	0.5
Upper quartile	3.0
Interquartile range	2.5
Stnd. skewness	7.60093
Stnd. kurtosis	4.1424

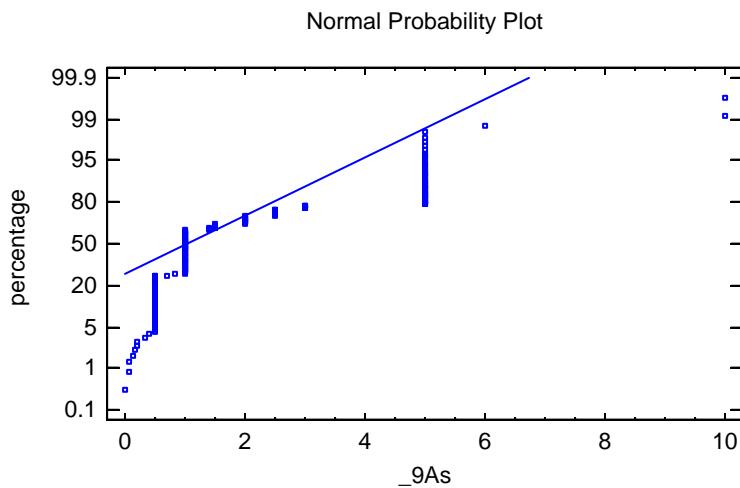
The StatAdvisor

This table shows summary statistics for 9As. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.



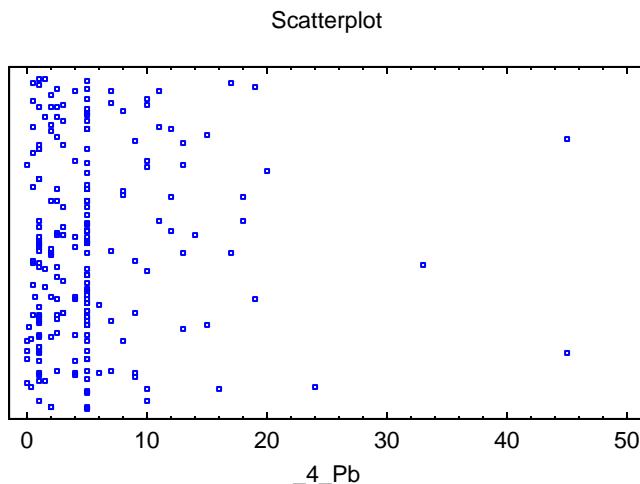
Percentiles for As

	Percentiles
1.0%	0.05
5.0%	0.5
10.0%	0.5
25.0%	0.5
50.0%	1.0
75.0%	3.0
90.0%	5.0
95.0%	5.0
99.0%	10.0



11) One-Variable Analysis - Lead (ug/L)

Data variable: Pb
210 values ranging from 0.0 to 45.0



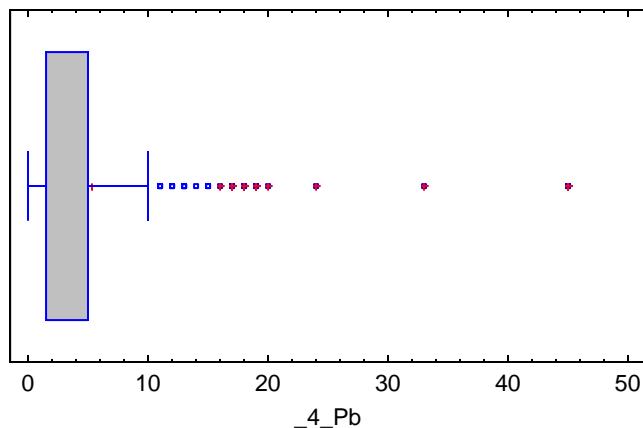
Summary Statistics for Pb

Count	210
Average	5.32979
Median	5.0
Standard deviation	6.20085
Coeff. of variation	116.343%
Minimum	0.0
Maximum	45.0
Range	45.0
Lower quartile	1.5
Upper quartile	5.0
Interquartile range	3.5
Stnd. skewness	20.3492
Stnd. kurtosis	49.6496

The StatAdvisor

This table shows summary statistics for Pb. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

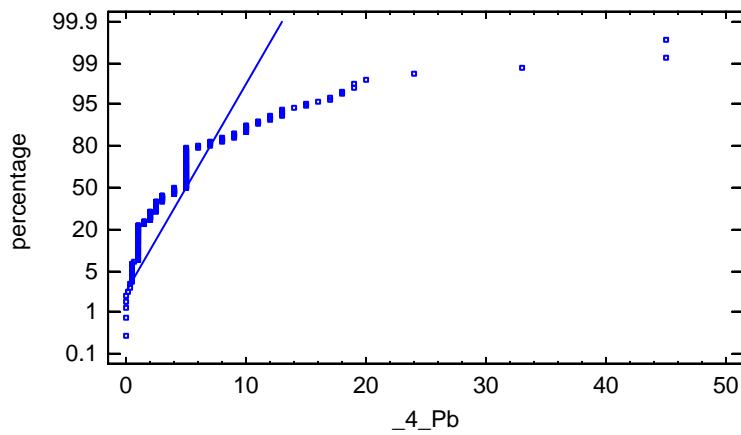
Box-and-Whisker Plot



Percentiles for Pb (ug/L)

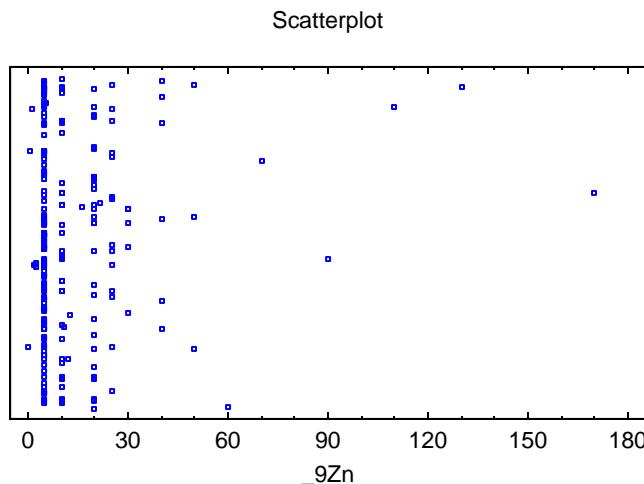
	Percentiles
1.0%	0.05
5.0%	0.5
10.0%	1.0
25.0%	1.5
50.0%	5.0
75.0%	5.0
90.0%	12.0
95.0%	16.99
99.0%	33.0

Normal Probability Plot



12) One-Variable Analysis – Zinc (ug/L)

Data variable: Zn
211 values ranging from 0.0 to 169.9



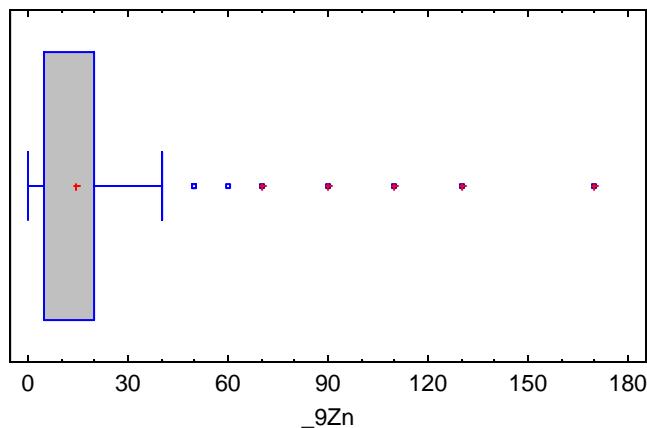
Summary Statistics for Zn

Count	211
Average	14.3877
Median	5.0
Standard deviation	19.4979
Coeff. of variation	135.518%
Minimum	0.0
Maximum	169.9
Range	169.9
Lower quartile	5.0
Upper quartile	19.99
Interquartile range	14.99
Stnd. skewness	27.1185
Stnd. kurtosis	81.6428

The StatAdvisor

This table shows summary statistics for Zn. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

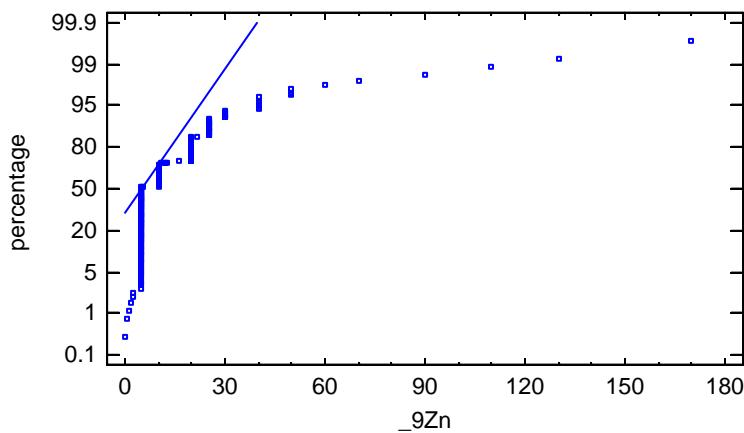
Box-and-Whisker Plot



Percentiles for Zn (ug/L)

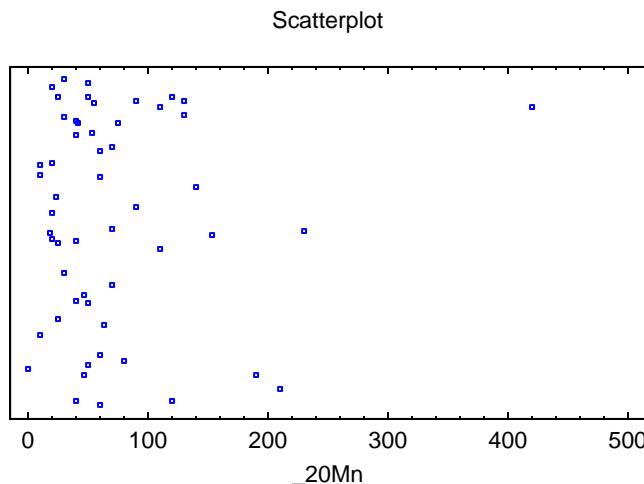
	Percentiles
1.0%	1.1
5.0%	5.0
10.0%	5.0
25.0%	5.0
50.0%	5.0
75.0%	19.99
90.0%	25.0
95.0%	40.0
99.0%	110.0

Normal Probability Plot



13) One-Variable Analysis – Manganese (ug/L)

Data variable: Mn
54 values ranging from 0.5 to 420.0

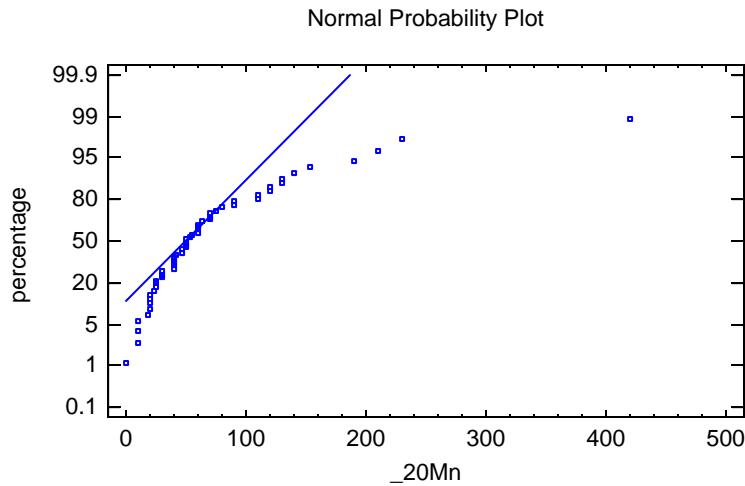


Summary Statistics for Mn (ug/L)

Count	54
Average	71.7106
Median	50.0
Standard deviation	70.1037
Coeff. of variation	97.7592%
Minimum	0.5
Maximum	420.0
Range	419.5
Lower quartile	30.0
Upper quartile	89.99
Interquartile range	59.99
Stnd. skewness	8.43672
Stnd. kurtosis	16.4311

The StatAdvisor

This table shows summary statistics for Mn. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

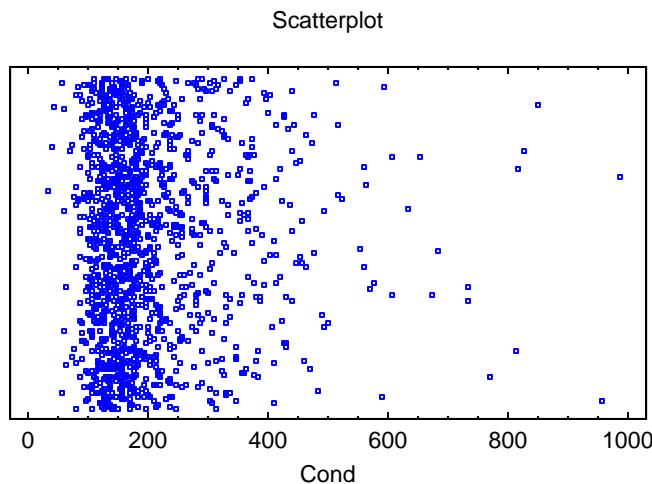


Percentiles for Mn (ug/L)

	<i>Percentiles</i>
1.0%	0.5
5.0%	10.0
10.0%	20.0
25.0%	30.0
50.0%	50.0
75.0%	89.99
90.0%	140.0
95.0%	210.0
99.0%	420.0

14) One-Variable Analysis – Specific Conductance (mS/cm)

Data variable: Cond
1348 values ranging from 33.6 to 986.0

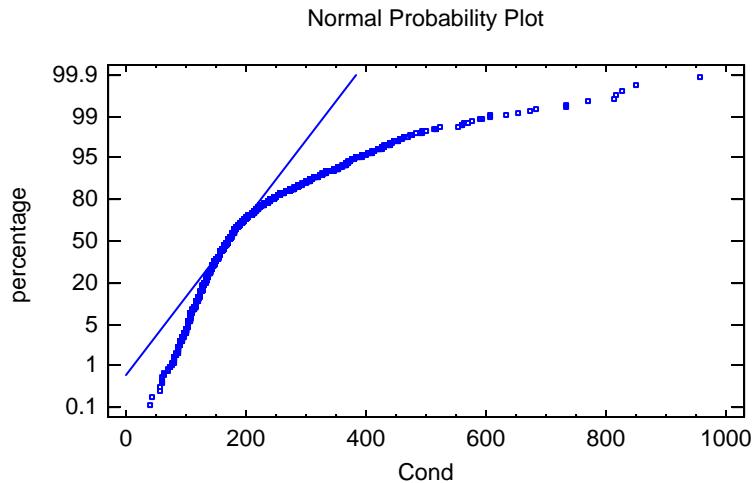


Summary Statistics for Cond

Count	1348
Average	200.599
Median	170.0
Standard deviation	107.738
Coeff. of variation	53.7085%
Minimum	33.6
Maximum	986.0
Range	952.4
Lower quartile	135.0
Upper quartile	228.0
Interquartile range	93.0
Stnd. skewness	37.5062
Stnd. kurtosis	71.7963

The StatAdvisor

This table shows summary statistics for Cond. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

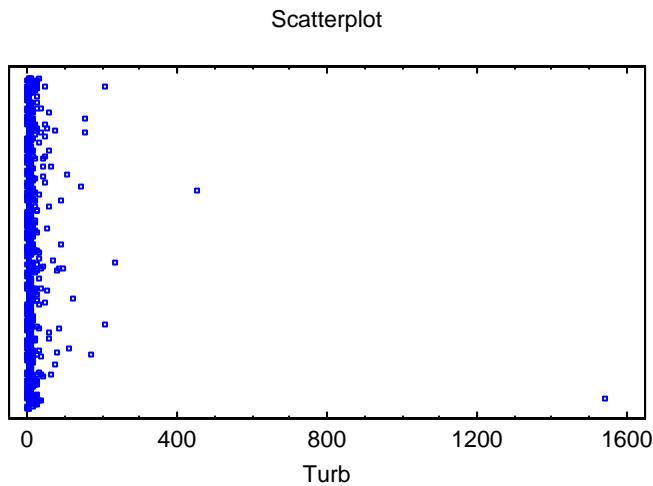


Percentiles for Cond

	Percentiles
1.0%	73.0
5.0%	99.7
10.0%	111.0
25.0%	135.0
50.0%	170.0
75.0%	228.0
90.0%	334.0
95.0%	411.0
99.0%	608.0

15) One-Variable Analysis – Turbidity (NTU)

Data variable: Turb
867 values ranging from 0.83 to 1540.0

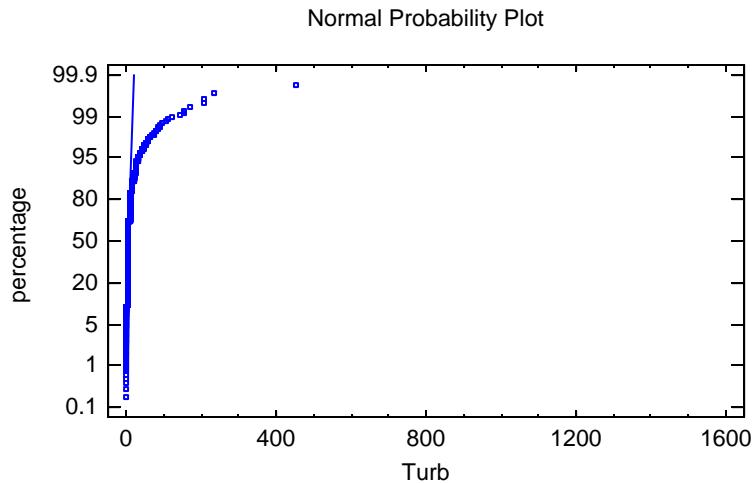


Summary Statistics for Turb

Count	867
Average	13.9644
Median	6.1
Standard deviation	57.8664
Coeff. of variation	414.387%
Minimum	0.83
Maximum	1540.0
Range	1539.17
Lower quartile	3.8
Upper quartile	10.8
Interquartile range	7.0
Stnd. skewness	264.399
Stnd. kurtosis	3389.93

The StatAdvisor

This table shows summary statistics for Turb. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

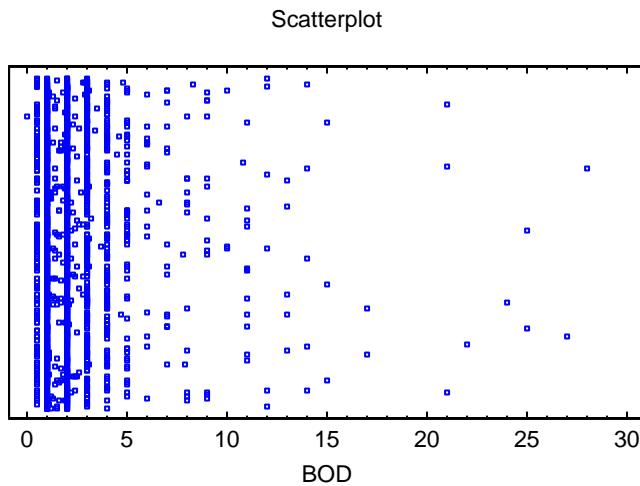


Percentiles for Turb

	<i>Percentiles</i>
1.0%	1.3
5.0%	1.83
10.0%	2.47
25.0%	3.8
50.0%	6.1
75.0%	10.8
90.0%	24.0
95.0%	38.7
99.0%	142.0

16) One-Variable Analysis - 5 day BOD (mg/L)

Data variable: BOD
2395 values ranging from 0.04 to 28.0

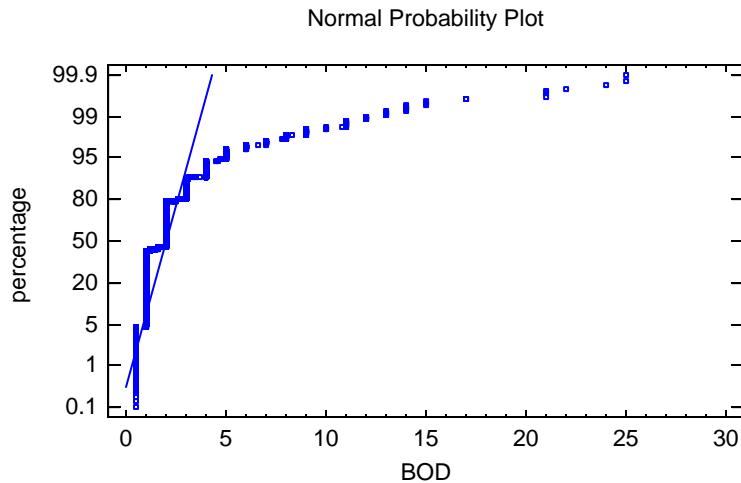


Summary Statistics for BOD

Count	2395
Average	2.1821
Median	2.0
Standard deviation	2.2915
Coeff. of variation	105.014%
Minimum	0.04
Maximum	28.0
Range	27.96
Lower quartile	1.0
Upper quartile	2.0
Interquartile range	1.0
Stnd. skewness	101.843
Stnd. kurtosis	375.027

The StatAdvisor

This table shows summary statistics for BOD. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

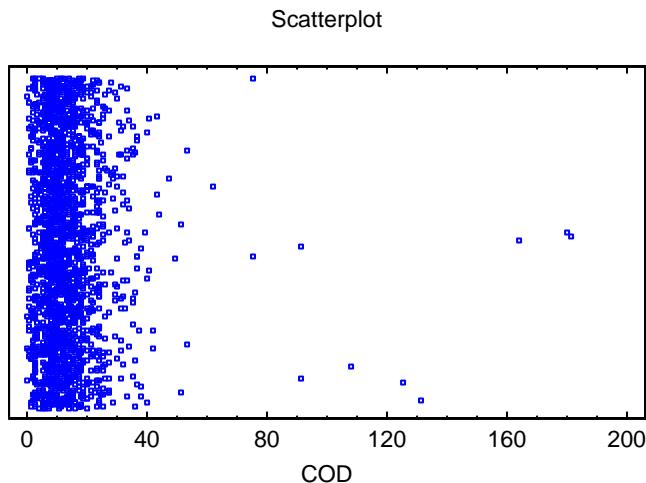


Percentiles for BOD

	<i>Percentiles</i>
1.0%	0.5
5.0%	0.5
10.0%	1.0
25.0%	1.0
50.0%	2.0
75.0%	2.0
90.0%	4.0
95.0%	5.0
99.0%	13.0

17) One-Variable Analysis – COD (mg/L)

Data variable: COD
1867 values ranging from 0.0 to 181.0

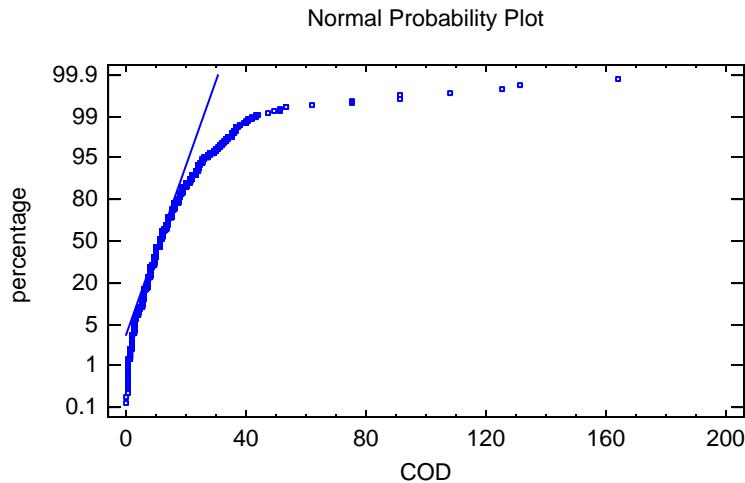


Summary Statistics for COD

Count	1867
Average	13.2609
Median	11.0
Standard deviation	11.5619
Coeff. of variation	87.1874%
Minimum	0.0
Maximum	181.0
Range	181.0
Lower quartile	7.5
Upper quartile	16.0
Interquartile range	8.5
Stnd. skewness	117.097
Stnd. kurtosis	677.68

The StatAdvisor

This table shows summary statistics for COD. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

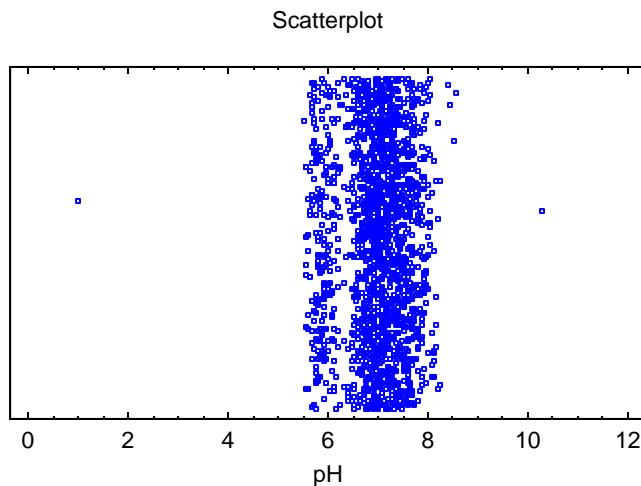


Percentiles for COD

	<i>Percentiles</i>
1.0%	0.5
5.0%	2.5
10.0%	4.0
25.0%	7.5
50.0%	11.0
75.0%	16.0
90.0%	23.0
95.0%	29.0
99.0%	43.0

18) One-Variable Analysis – pH (standard units)

Data variable: pH
1656 values ranging from 1.0 to 10.28



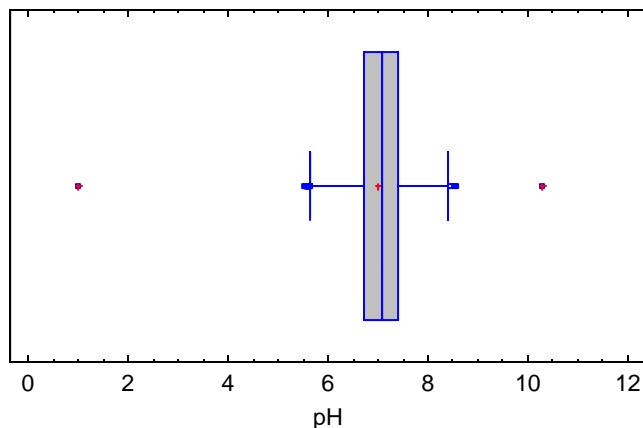
Summary Statistics for pH

Count	1656
Average	6.99518
Median	7.06
Standard deviation	0.605716
Coeff. of variation	8.65905%
Minimum	1.0
Maximum	10.28
Range	9.28
Lower quartile	6.7
Upper quartile	7.4
Interquartile range	0.7
Stnd. skewness	-15.6138
Stnd. kurtosis	48.4786

The StatAdvisor

This table shows summary statistics for pH. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

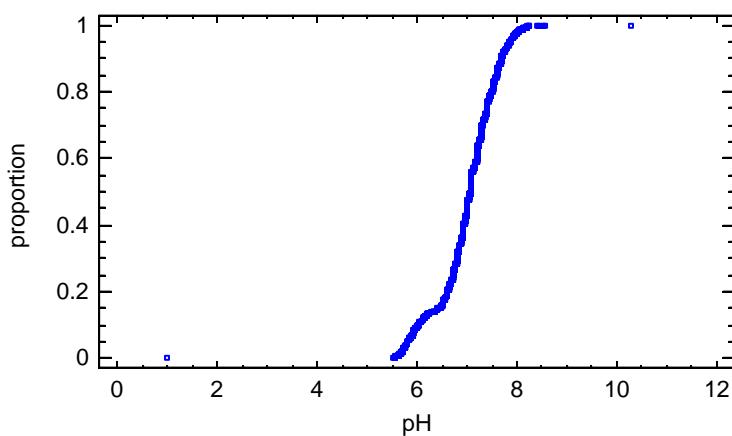
Box-and-Whisker Plot



Percentiles for pH

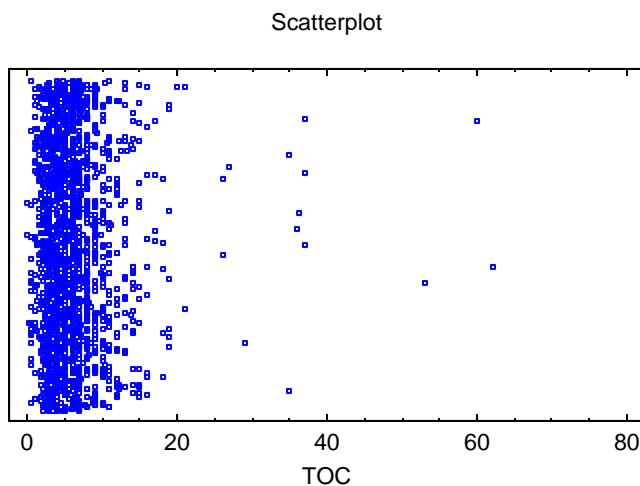
	Percentiles
1.0%	5.63
5.0%	5.81
10.0%	6.01
25.0%	6.7
50.0%	7.06
75.0%	7.4
90.0%	7.7
95.0%	7.88
99.0%	8.12

Quantile Plot



19) One-Variable Analysis – TOC (mg/L)

Data variable: TOC
1763 values ranging from 0.0 to 62.0

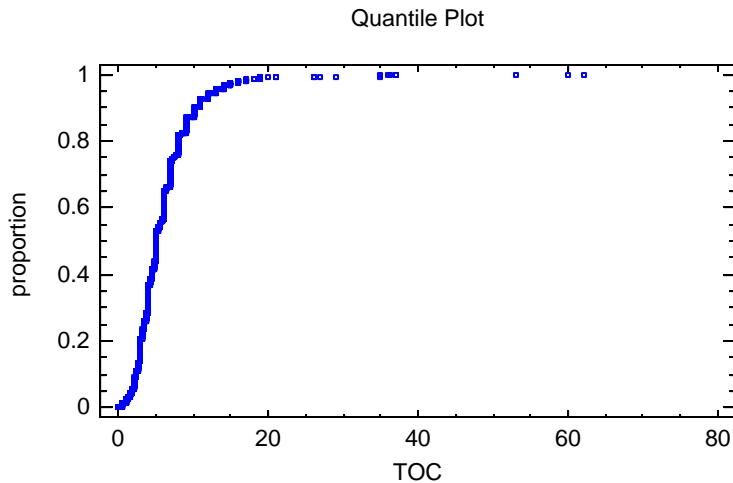


Summary Statistics for TOC

Count	1763
Average	6.07879
Median	5.0
Standard deviation	4.49945
Coeff. of variation	74.0188%
Minimum	0.0
Maximum	62.0
Range	62.0
Lower quartile	3.5
Upper quartile	7.5
Interquartile range	4.0
Stnd. skewness	77.8974
Stnd. kurtosis	338.969

The StatAdvisor

This table shows summary statistics for TOC. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.



Percentiles for TOC

	<i>Percentiles</i>
1.0%	0.5
5.0%	1.86
10.0%	2.4
25.0%	3.5
50.0%	5.0
75.0%	7.5
90.0%	10.3
95.0%	13.0
99.0%	19.0

DEQ Surface Water Quality Table Relates

David Ward
February 21, 2007

Background:

The VA Dept of Environmental Quality (DEQ), samples surface water through out Loudoun. Data is posted on their web site. Other memos describe download and formatting. This memo summarizes how to work with data in GIS

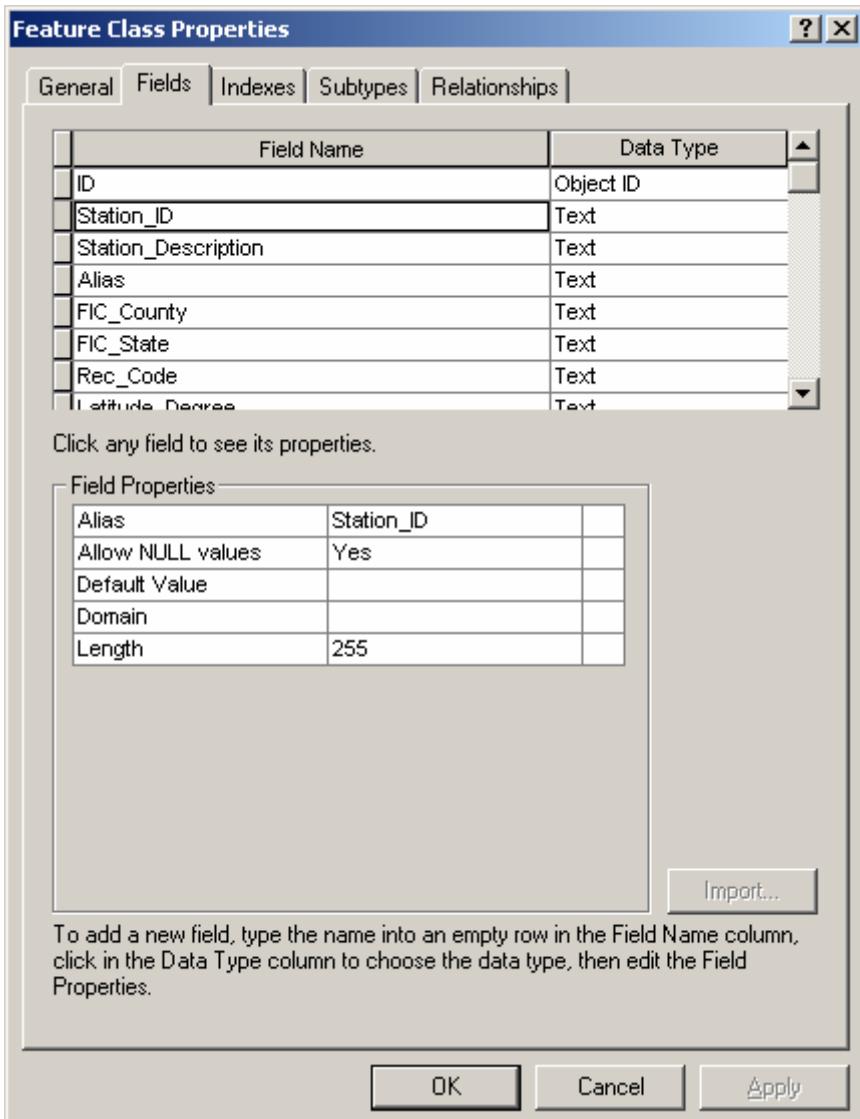
Previous Work:

The station locations are stored in a personal geodatabase (692 KB)

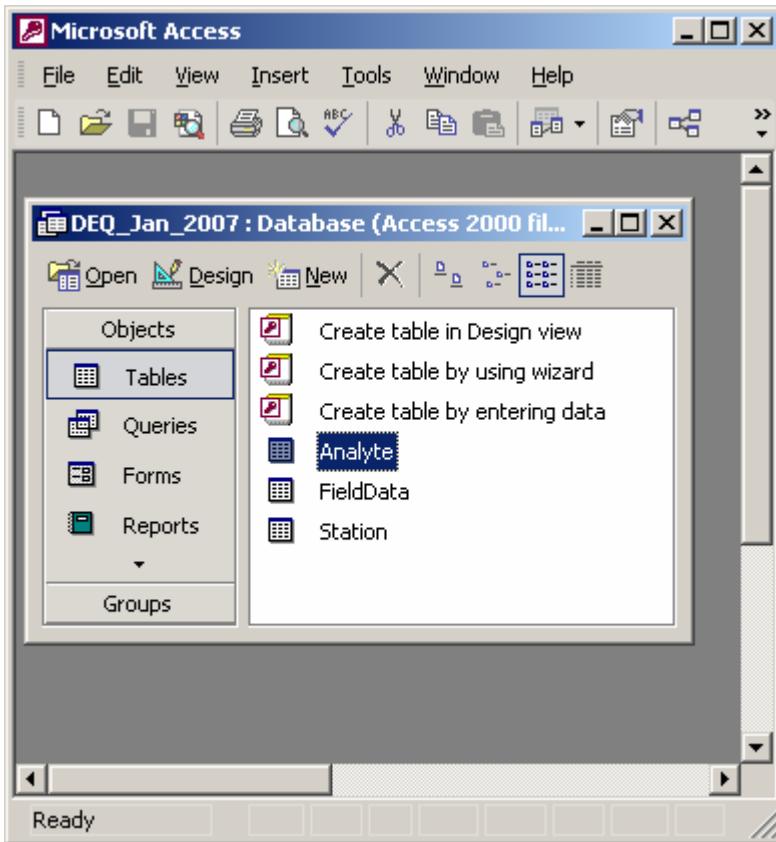
A screenshot of the ArcCatalog application window. The title bar reads "ArcCatalog - ArcInfo - D:\project\wrmp\VA_DEQ_Stream_WQ\pgdb\DEQ_Stations.mdb\DEQ_Stations_HARN". The menu bar includes File, Edit, View, Go, Tools, Window, and Help. The toolbar contains various icons for file operations like Open, Save, and Print. Below the toolbar is a ribbon with tabs for Conversion Tools, Export Schema, Import Schema, Utility, and a search icon. The main pane shows a tree view of the project structure on the left and a table view of the "DEQ_Stations_HARN" table on the right. The table has 130 records. The columns are: ID#, Station_ID, Station_Description, A, Fl, Fl, Re, Lat1, Lat1, Latitude, Lon, Long, LV1_Cod, LV2_Cod, LV3_Code, and L. The table data includes various station identifiers and coordinates.

ID#	Station_ID	Station_Description	A	Fl	Fl	Re	Lat1	Lat1	Latitude	Lon	Long	LV1_Cod	LV2_Cod	LV3_Code	L
108	1ANOC009.13	Rt. # 690	--	10	5	NV	39	11	39.00	-77	43	14.00	STREAM	AMBN	--
109	1ANOC009.37	Rt. # 812 (Gaver Mill Road)	--	10	5	NV	39	11	44.50	-77	45	27.00	STREAM	AMBN	AWTSHD
110	1ANOC011.74	Rt. # 716	--	10	5	NV	39	11	45.00	-77	45	27.00	STREAM	AMBN	--
111	1ASOC001.66	Rt. # 698 (Near Waterford)	--	10	5	NV	39	11	27.00	-77	36	57.00	STREAM	AMBN	AWTSHD
112	1ASOC005.46	Rt. # 9	--	10	5	NV	39	9	49.00	-77	38	39.00	STREAM	AMBN	--
113	1ASOC007.06	Rt. # 738	--	10	5	NV	39	9	57.00	-77	40	3.00	STREAM	AMBN	AWTSHD
114	1ASOC008.46	Rt. # 287	--	10	5	NV	39	10	14.00	-77	41	13.00	STREAM	AMBN	--
115	1ASOC010.09	Rt. 711	--	10	5	NV	39	9	32.90	-77	41	55.30	STREAM	AMBN	BIOMON
116	1ASOC011.82	RT. 611 BRI BELOW J.L. CO	--	10	5	NV	39	8	31.00	-77	42	52.00	STREAM	AMBN	--
117	1ASOC012.38	Rt. # 690 (Above J.L.Cornw)	--	10	5	NV	39	8	31.00	-77	43	23.00	STREAM	AMBN	--
118	1ASOC014.58	Rt. # 711	--	10	5	NV	39	9	34.00	-77	45	1.00	STREAM	AMBN	--
119	1ASOC015.92	Rt. # 719	--	10	5	NV	39	10	16.00	-77	46	11.00	STREAM	AMBN	--
120	1AXBL000.28	Rt. # 711	--	10	5	NV	39	9	29.00	-77	39	24.00	STREAM	AMBN	--
121	1AXJT002.22	Cottage Grove Lane	--	10	5	NV	39	13	9.10	-77	37	42.60	STREAM	AMBN	AWTSHD
122	1AXKR000.77	Downstream from Rt. 663	V	10	5	NV	39	15	28.20	-77	35	25.60	STREAM	AMBN	APROB
123	1ADUT000.62	Rt. # 674 (Near Mouth of Cre	--	10	5	NV	39	16	24.00	-77	39	5.00	STREAM	AMBN	--
124	1ADUT002.72	Rt. # 673	--	10	5	NV	39	17	13.00	-77	39	39.00	STREAM	AMBN	--
125	1APIA000.18	Rt. # 340	--	10	5	NV	39	19	12.00	-77	42	50.00	STREAM	AMBN	--
126	1APIA001.80	Rt. # 671 (Harpers Ferry Rd)	--	10	5	NV	39	18	39.65	-77	43	6.98	STREAM	AMBN	ATRND
127	1APIA004.67	Rt. # 685	--	10	5	NV	39	17	6.00	-77	43	54.00	STREAM	AMBN	--
128	1APIA007.08	Rt. # 687	--	10	5	NV	39	15	41.00	-77	43	39.00	STREAM	AMBN	--
129	1APOT1170.40	Rt. # 340 (VA- MD Line)	--	04	2	NV	39	19	20.00	-77	42	31.00	STREAM	AMBN	--

This includes the 15-character variable: "Station_ID".



The analyte and field data contain the chemical concentration and monitoring time series data are stored in a MS Access file (18 MB). There are over 80,000 records.



Here we also have “Station_ID” as a 255 character variable.

We can relate these two fields even though they are 255 characters. This may impact performance and need to be reduced later to speed up the GIS. For now, keep both at 255 characters.

In ArcGIS 9.1, time values are not handled well. Revisions in ArcMap 9.2 have improved charting that allow for a proper date field.

We also want to be able to use data with AquaChem.

Microsoft Access

File Edit View Insert Tools Window Help Type a question for help

Analyte : Table

	Field Name	Data Type	Description
ID	AutoNumber		
Station_ID	Text		
Collection_Date_Time	Text		
Sample_ID	Text		
Parameter_Code	Text		
Parameter_Name	Text		
Value	Text		
Comment_Code	Text		
Comment_Description	Text		

Field Properties

General | Lookup |

Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None

Design view. F6 = Switch panes. F1 =

This screenshot shows the Microsoft Access application interface. A window titled 'Analyte : Table' is open, displaying a table structure with nine fields: ID, Station_ID, Collection_Date_Time, Sample_ID, Parameter_Code, Parameter_Name, Value, Comment_Code, and Comment_Description. The 'Data Type' column indicates that 'ID' is an AutoNumber type, while all other fields are Text. Below the table is a 'Field Properties' pane. The 'General' tab is selected, showing various properties for the 'Value' field, such as Field Size (255), Required (No), Allow Zero Length (Yes), and Indexed (No). Other tabs in the properties pane include 'Lookup'. At the bottom of the window, a status bar displays the message 'Design view. F6 = Switch panes. F1 ='. The overall interface is characteristic of Microsoft Access 2003 or later versions.

DEQ Surface Water Quality Station Mapping

David Ward
January 22, 2007

Background:

The VA Dept of Environmental Quality (DEQ), samples surface water through out Loudoun. Data is posted on their web site and need to be downloaded on a scheduled basis. Data must be queried by watershed, therefore data outside of Loudoun is included.

DEQ Stations:

Prefer to separate document on downloading data. This memo is limited to the post processing and conversion of latitude/longitude into personal geodata feature class in SPC VA N HARN.

The DEQ stations have been downloaded and merged into one file. The table is in MS Access and can be used directly to create a feature class.

As of Jan 2007 some clean-up is necessary. Before we do this, there are two data errors in DEQ's tables. The negative sign is missing on 2 stations. An email has been sent to DEQ. As of Aug 2007, DEQ has made the revisions.

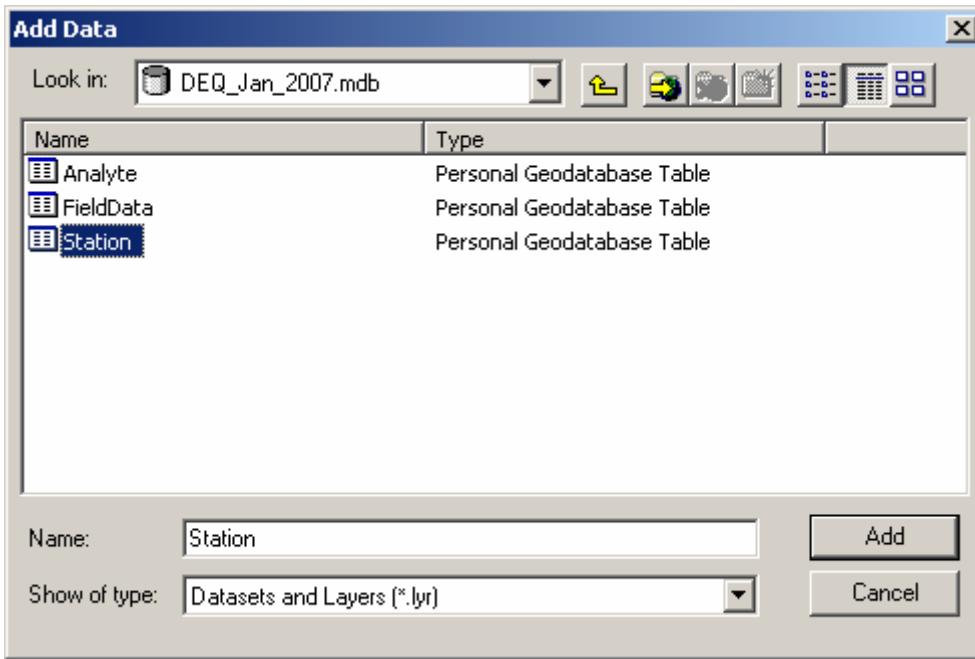
Attributes of DEQ_Station_HARN											
Station_ID	Station_Descri	Ali	FIC	FIC_C	Rec_C	Latit	Latitu	Latitude_Se	Longitude_Degree	Longitude_Min	Longitude_Se
1ASOC011.82	RT. 611 BRI BEL	--	107	51	NVRO	39	8	31.00	-77	42	52.00
1ASOC012.38	Rt. # 690 (Above	--	107	51	NVRO	39	8	31.00	-77	43	23.00
1ASOC014.58	Rt. # 711	--	107	51	NVRO	39	9	34.00	-77	45	1.00
1ASOC015.92	Rt. # 719	--	107	51	NVRO	39	10	16.00	-77	46	11.00
1AXBL000.28	Rt. # 711	--	107	51	NVRO	39	9	29.00	-77	39	24.00
1AXJT002.22	Cottage Grove La	--	107	51	NVRO	39	13	9.10	-77	37	42.60
1AXKR000.77	Downstream fro	VA	107	51	NVRO	39	15	28.20	-77	35	25.60
1ADUT000.82	Rt. # 674 (Near M	--	107	51	NVRO	39	18	24.00	-77	39	5.00
1ADUT002.72	Rt. # 673	--	107	51	NVRO	39	17	13.00	-77	39	39.00
1APIA000.18	Rt. # 340	--	107	51	NVRO	39	19	12.00	-77	42	50.00
1APIA001.80	Rt. # 671 (Harper	--	107	51	NVRO	39	18	39.65	-77	43	6.98
1APIA004.67	Rt. # 685	--	107	51	NVRO	39	17	6.00	-77	43	54.00
1APIA007.08	Rt. # 687	--	107	51	NVRO	39	15	41.00	-77	43	39.00
1APOT170.40	Rt. # 340 (VA- M	--	043	24	NVRO	39	19	20.00	-77	42	31.00
1AXC0000.39	Rt. # 674	--	107	51	NVRO	39	17	18.00	-77	39	14.00
1ABRB006.33	Rt. # 625 (Waxpo	r	107	51	NVRO	39	0	34.00	77	27	7.00
1ASOC010.09	Rt. 711	--	107	51	NVRO	39	9	32.90	77	41	55.30

Edit these values in MS Access and save.

There are two ways to populate decimal degrees. One is using MS Access, the other is using ArcGIS.

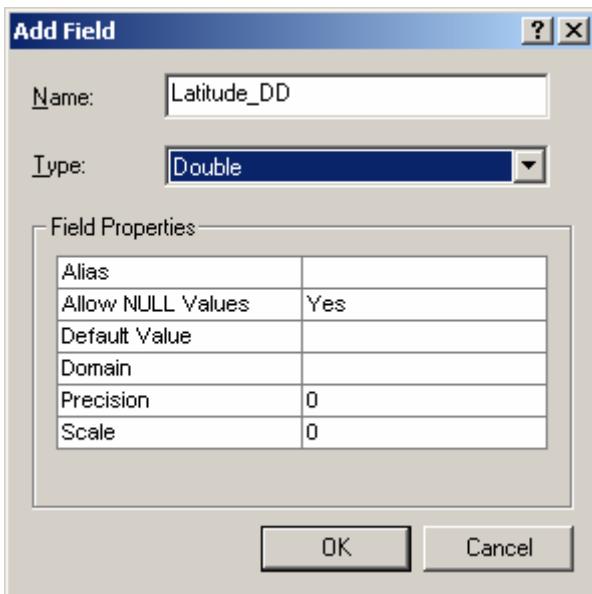
Adding decimal degrees Using ArcGIS

Add the table to ArcGIS:

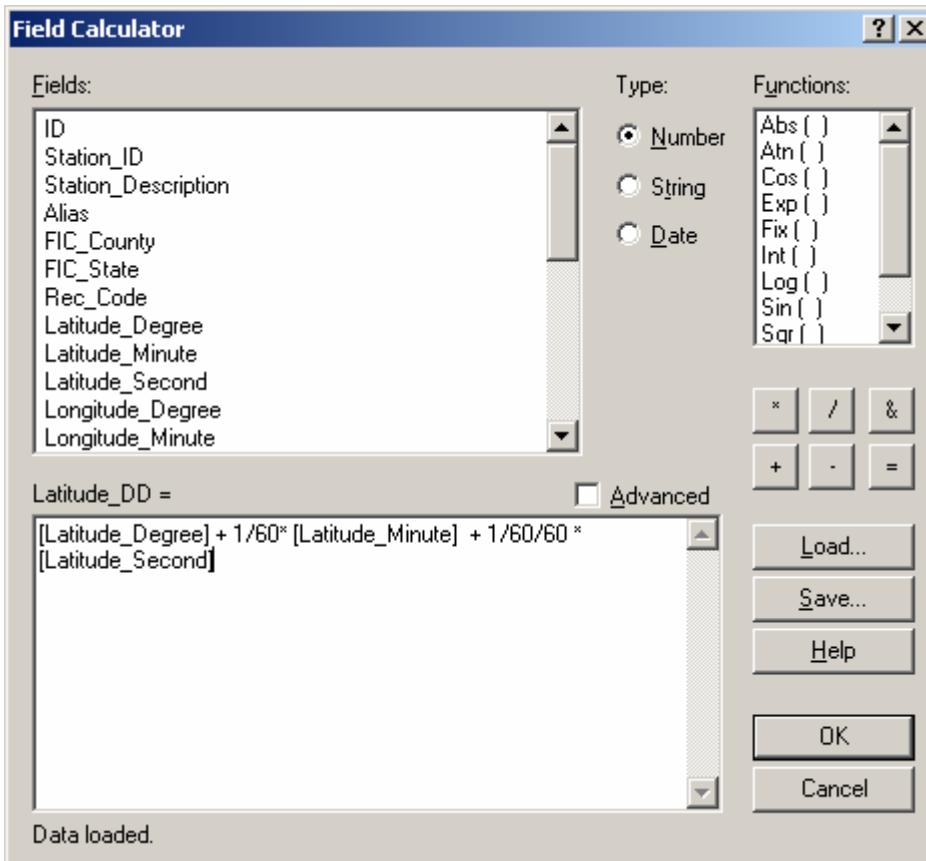


We can calculate decimal degrees using field calculator in ArcMap.

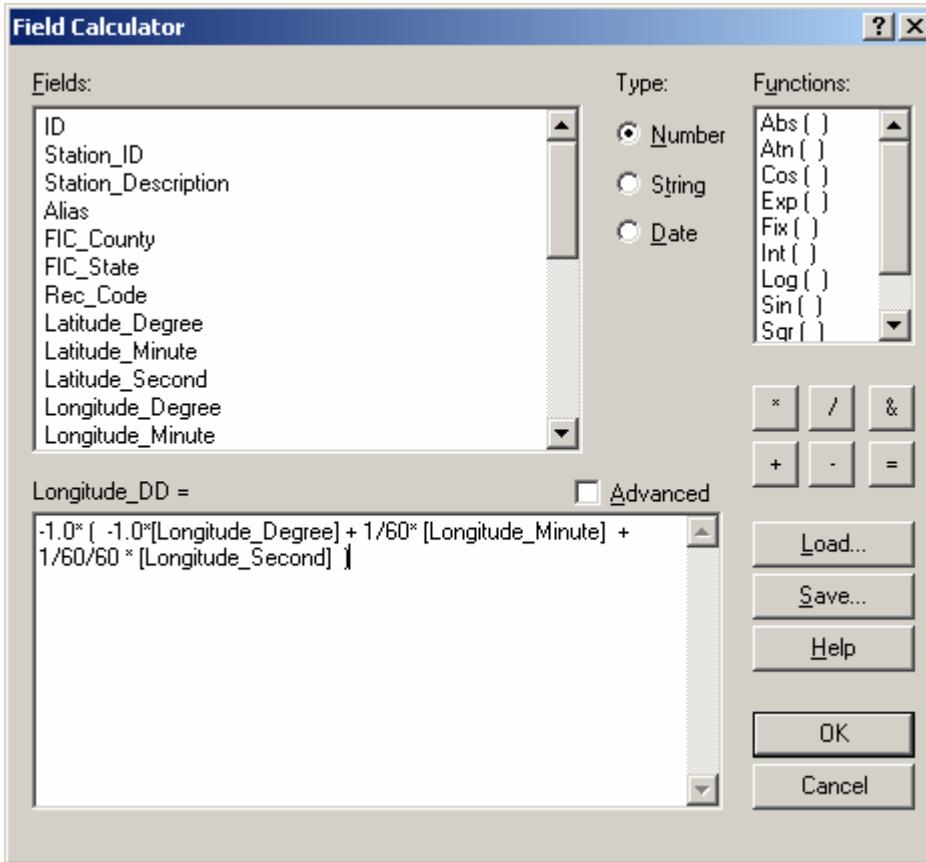
First add fields: Latitude_DD and Longitude_DD as double.



Then use field calculator with the expressions:

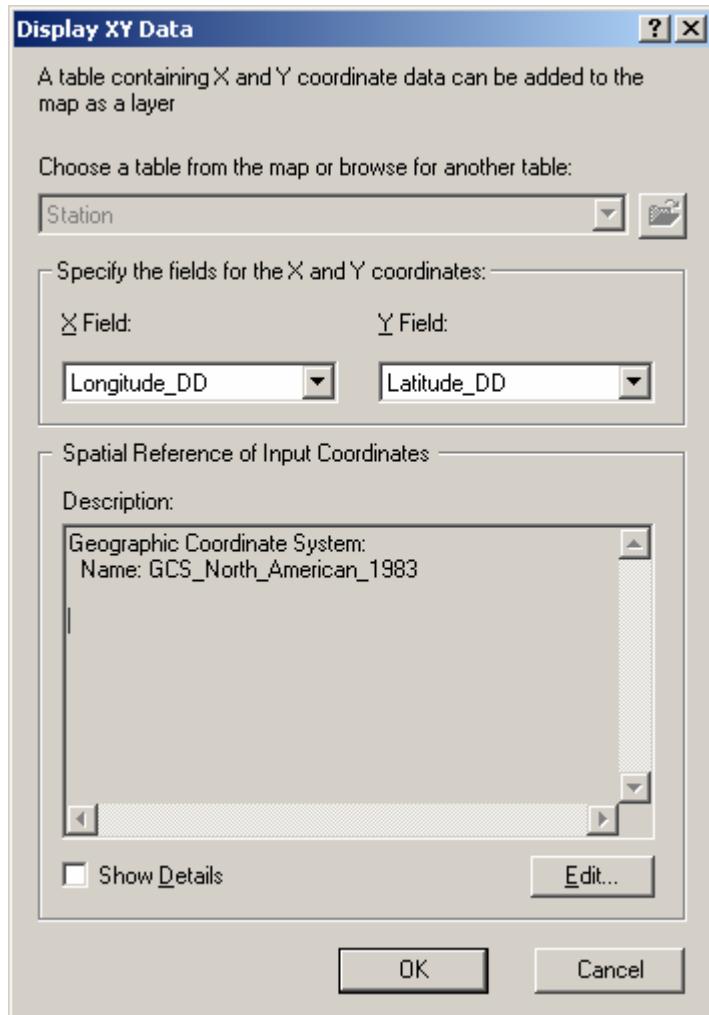


and

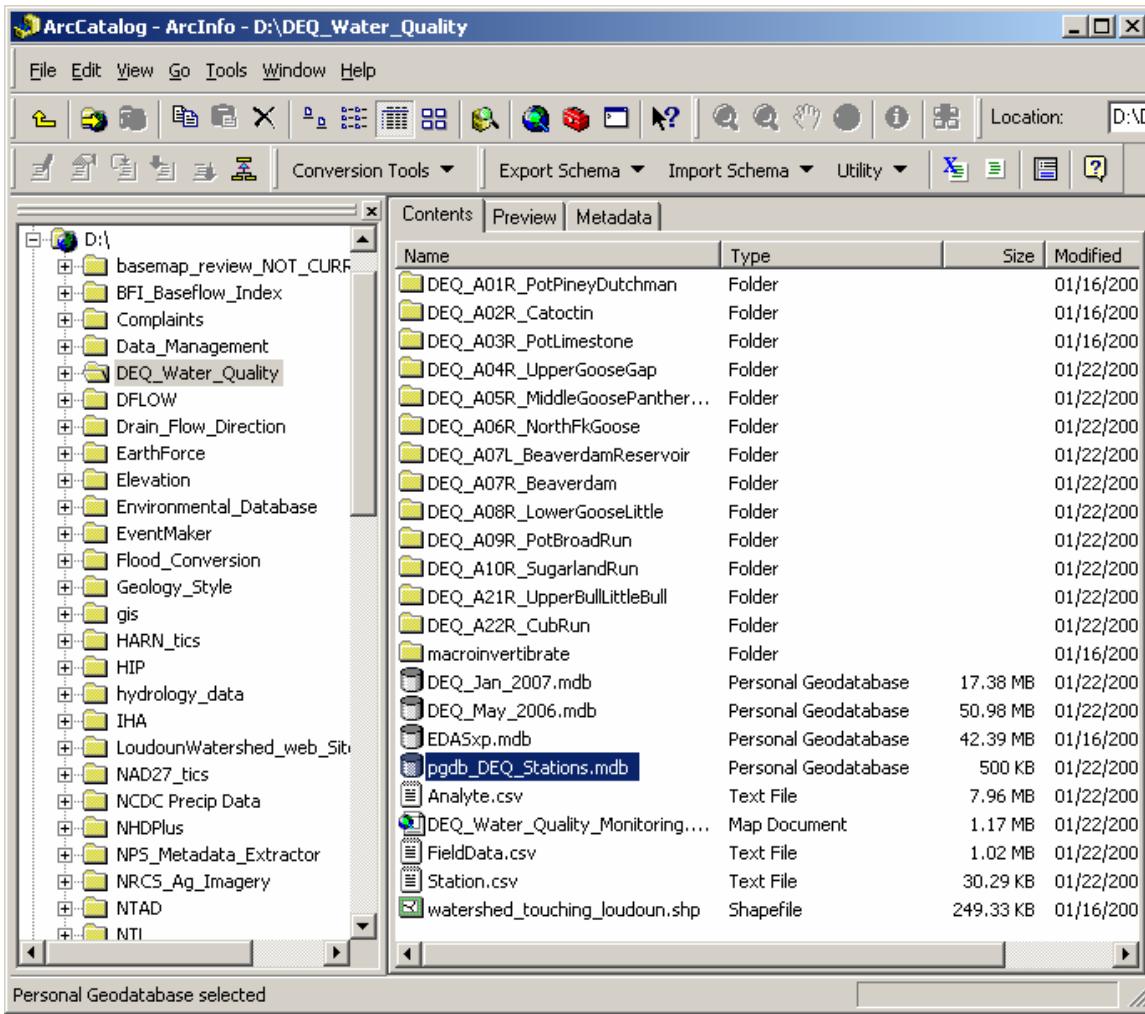


Carefully note the syntax on longitude as DEQ's way of providing D-M-S is a little unusual.

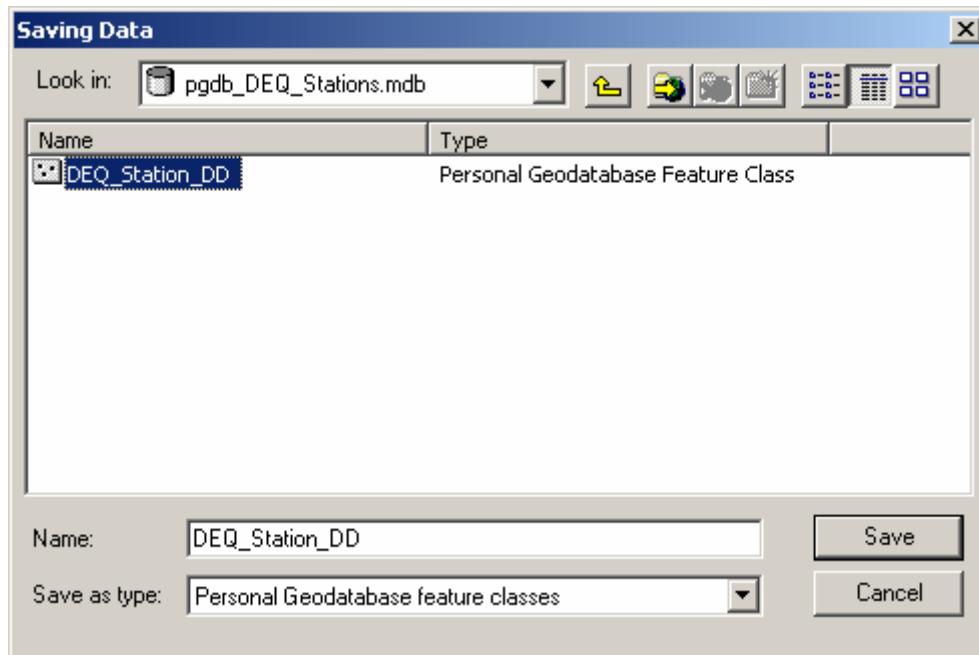
We can now use “Display XY” in ArcMap. Here, we select geographic projection of simple NAD83.

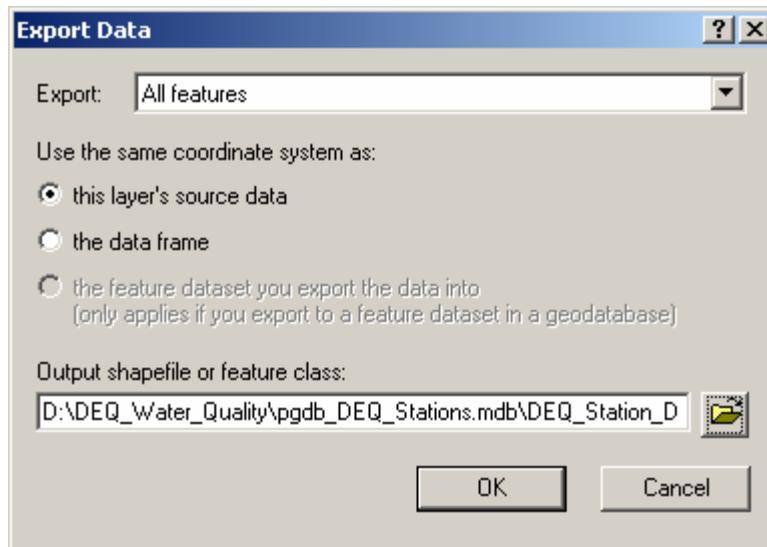


Now we want to create blank personal geodatabase in ArcCatalog.

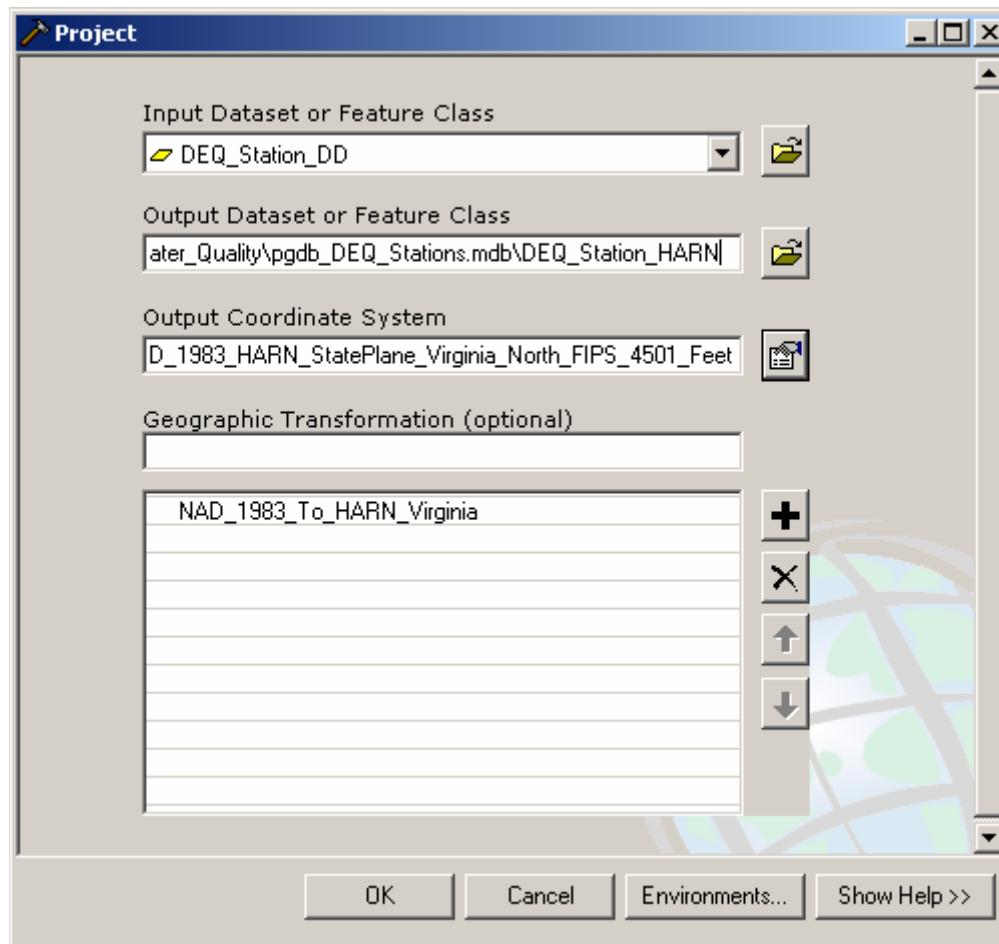


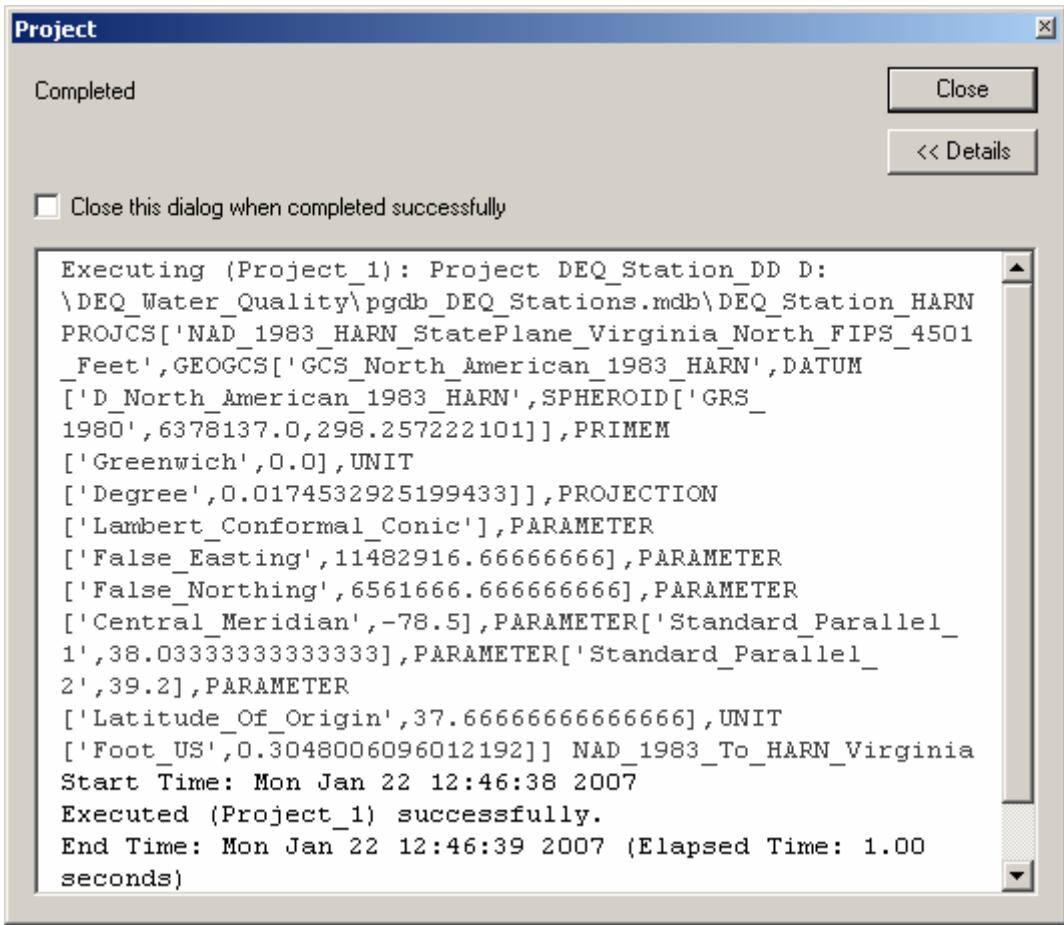
Going back to the marker events, we export these to the new pgdb in native NAD83 DD:





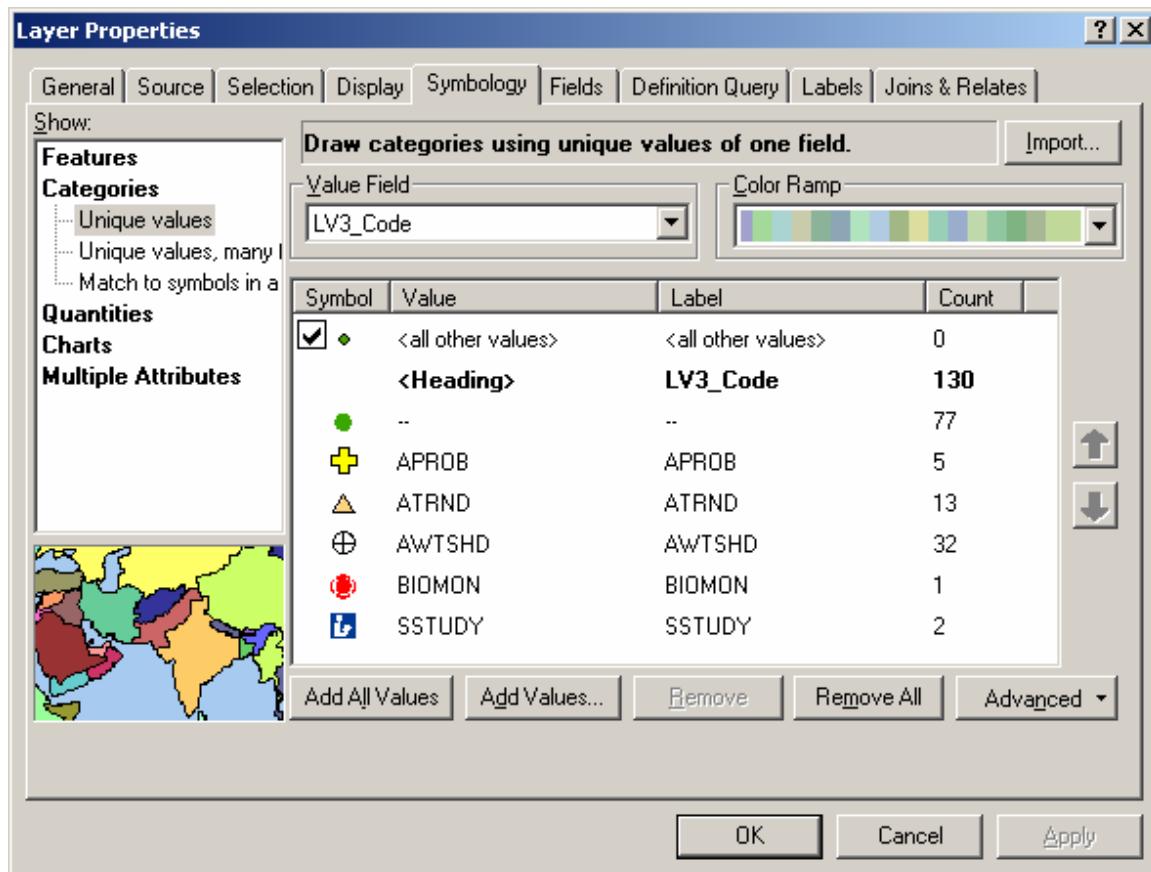
Now project the data to Virginia State Plane, HARN, US Feet.





For now, we will maintain those stations outside of Loudoun and they may be useful in analysis of upstream and downstream conditions.

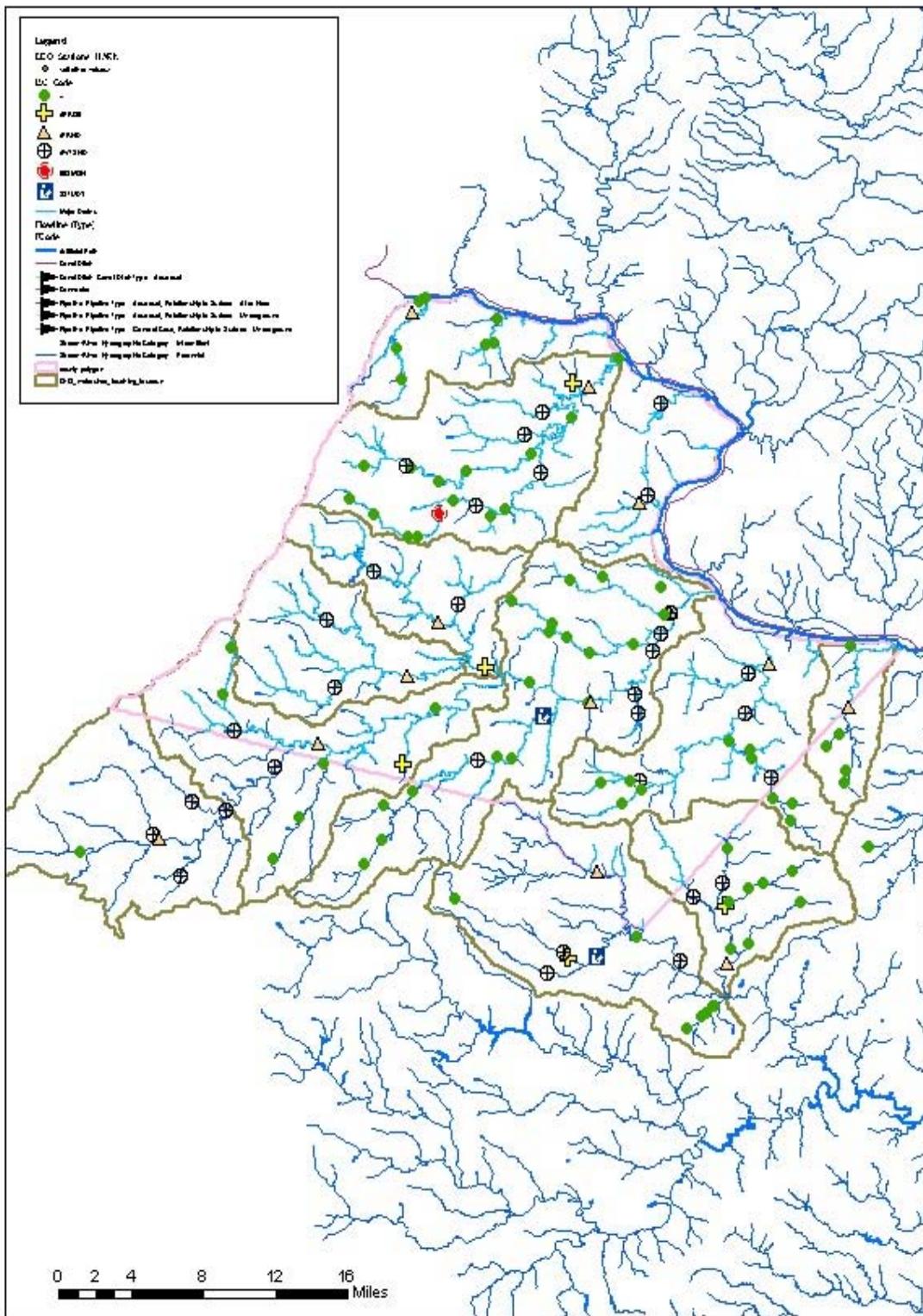
In ArcGIS, symbolize based on type of monitoring stations



where:

- PROB = Probabilistic
- TRND = Trend
- WTSHD = ?? watershed ??
- BIOMON = Macroinvertebrate or biological monitoring
- SSTUDY = Special studies.

not

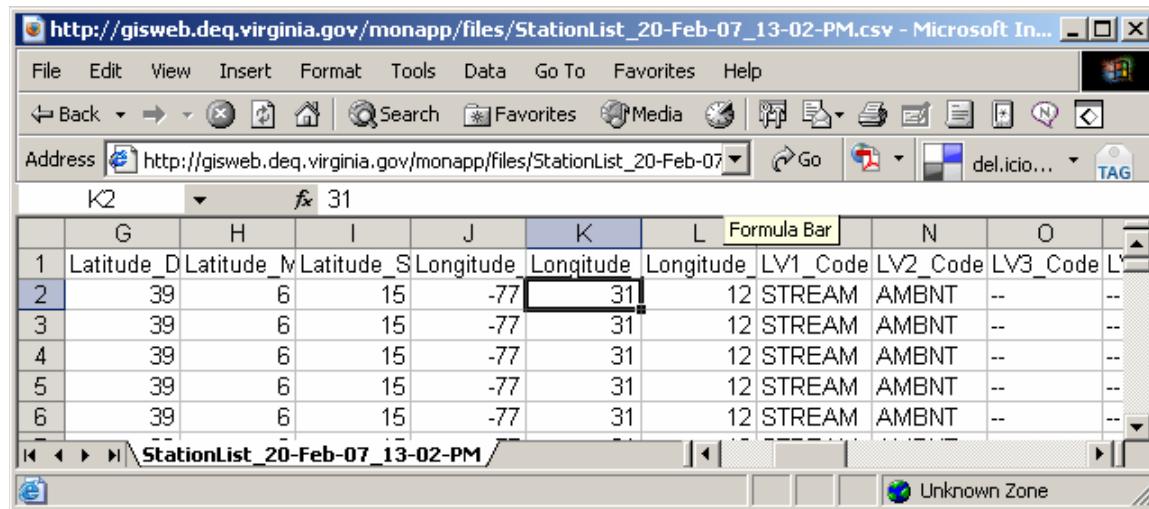


Note that stations outside of Loudoun are important. For example, Cub Run Bull Run flowing out of Loudoun has two stations in Fairfax County, but none in Loudoun. On Sugarland Run flowing into Loudoun has a station in Fairfax County.

Revisions:

In reviewing station 1ATUS003.19 on Tuscarora Creek in Leesburg, the coordinates were found to be incorrect http://gisweb.deq.virginia.gov/monapp/mon_query_form.cfm. Values are provided in D-M-S. These were converted these to decimal degrees for mapping. The site should be located along Rt 643, aka Plaza St. I believe the location is due west of the coordinates provided. I believe the error is that the report "Longitude_Minute" needs to be changed from 31 to 33. DEQ replied on 2/20/2007 that there were in error. The web has not yet been updated.

http://gisweb.deq.virginia.gov/monapp/files/StationList_20-Feb-07_13-02-PM.csv



A screenshot of a Microsoft Internet Explorer window displaying a CSV file titled 'StationList_20-Feb-07_13-02-PM.csv'. The file is presented in a grid format with various columns labeled (G, H, I, J, K, L, N, O) and rows numbered 1 through 6. The data includes coordinates for stations, such as Latitude_D, Latitude_M, Latitude_S, Longitude_D, Longitude_M, Longitude_S, and station codes like LV1_Code, LV2_Code, and LV3_Code. The browser interface shows standard menu bars, toolbars, and status bars.

	G	H	I	J	K	L	Formula Bar	N	O
1	Latitude_D	Latitude_M	Latitude_S	Longitude_D	Longitude_M	Longitude_S	LV1_Code	LV2_Code	LV3_Code
2	39	6	15	-77	31		12	STREAM	AMBNT
3	39	6	15	-77	31		12	STREAM	AMBNT
4	39	6	15	-77	31		12	STREAM	AMBNT
5	39	6	15	-77	31		12	STREAM	AMBNT
6	39	6	15	-77	31		12	STREAM	AMBNT

Data revisions were made to both the station pgdb “pgdb_DEQ_Stations.mdb” and the related table Access file, “DEQ_Jan_2007.mdb”.

Adding decimal degrees using MS Access

We can populate the decimal degrees directly in MS Access.



Data Clean-up

In order to make data for efficient, the character fields needs to be trimmed.

DEQ Surface Water Quality Data Maintenance

David Ward
January 22, 2007

Background:

The VA Dept of Environmental Quality (DEQ), samples surface water through out Loudoun. Data is posted on their web site and need to be downloaded on a scheduled basis.

DEQ Web Server:

Presently DEQ uses a Cold Fusion web server to provide water quality measurements to the public. This will likely change in 2007 to an Oracle-based web server. It is anticipated that this will change the procedures somewhat. Hopefully the query will allow for all of Loudoun data to be queried at once. Regardless of the web server used, the process will continue as:

Download ASCII files from web server --- >

Load to MS Access --- >

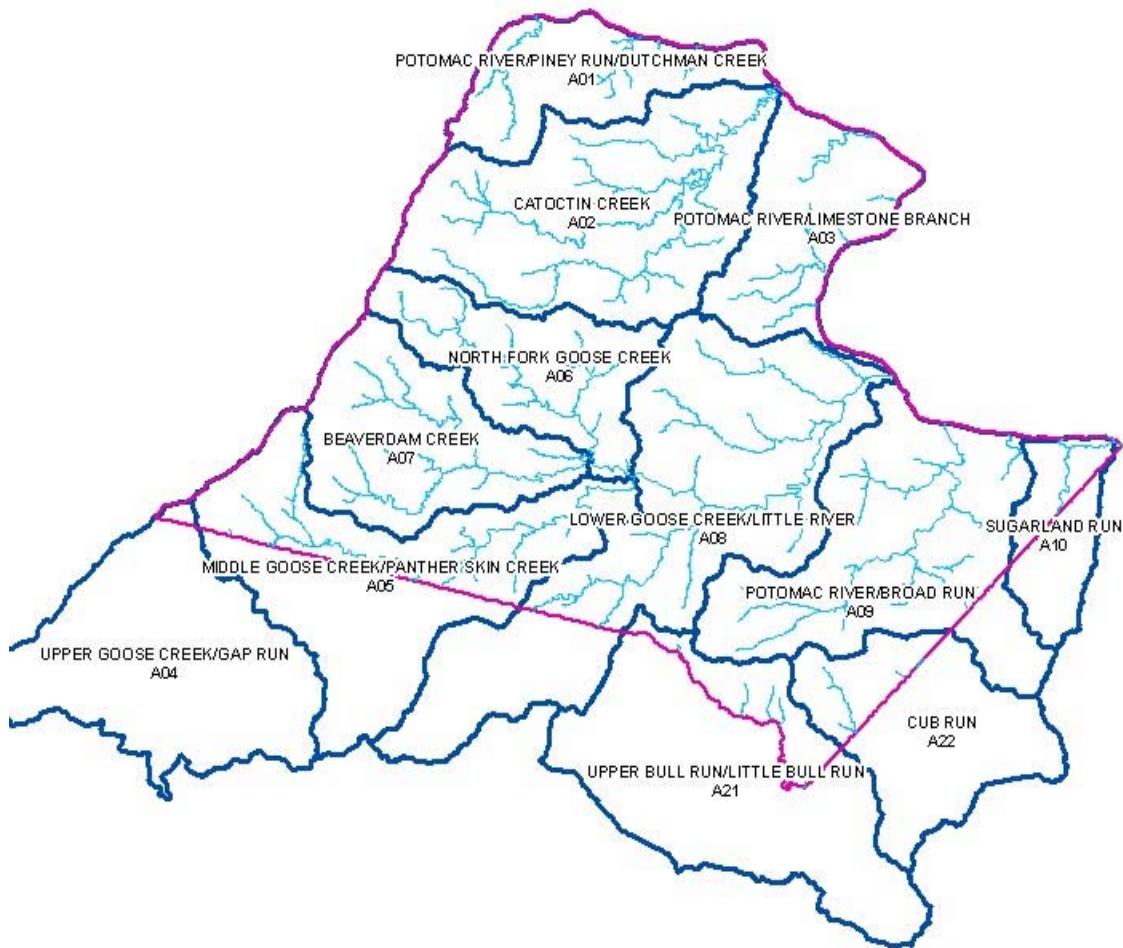
Construct time series tables to relate to DEQ stations feature class in GIS.

Overview of Watersheds:

The DEQ data are currently downloaded by watershed. To cover Loudoun County, there are thirteen watersheds of interest. There are actually 12 watersheds (“R” for river and one reservoir “L” for lake):

A01R	Potomac River/Piney Run/Dutchman Creek
A02R	Catoctin Creek
A03R	Potomac River/Limestone Branch
A04R	Upper Goose Creek/Gap Run
A05R	Middle Goose Creek/Panther Skin Creek
A06R	North Fork Goose Creek
A07R	Beaverdam Creek
A08L	Beaverdam Creek Reservoir
A08R	Lower Goose Creek/Little River
A09R	Potomac River/Broad Run
A10R	Sugarland Run
A21R	Upper Bull Run/Little Bull Run
A22R	Cub Run

Some watersheds extend into neighboring counties:

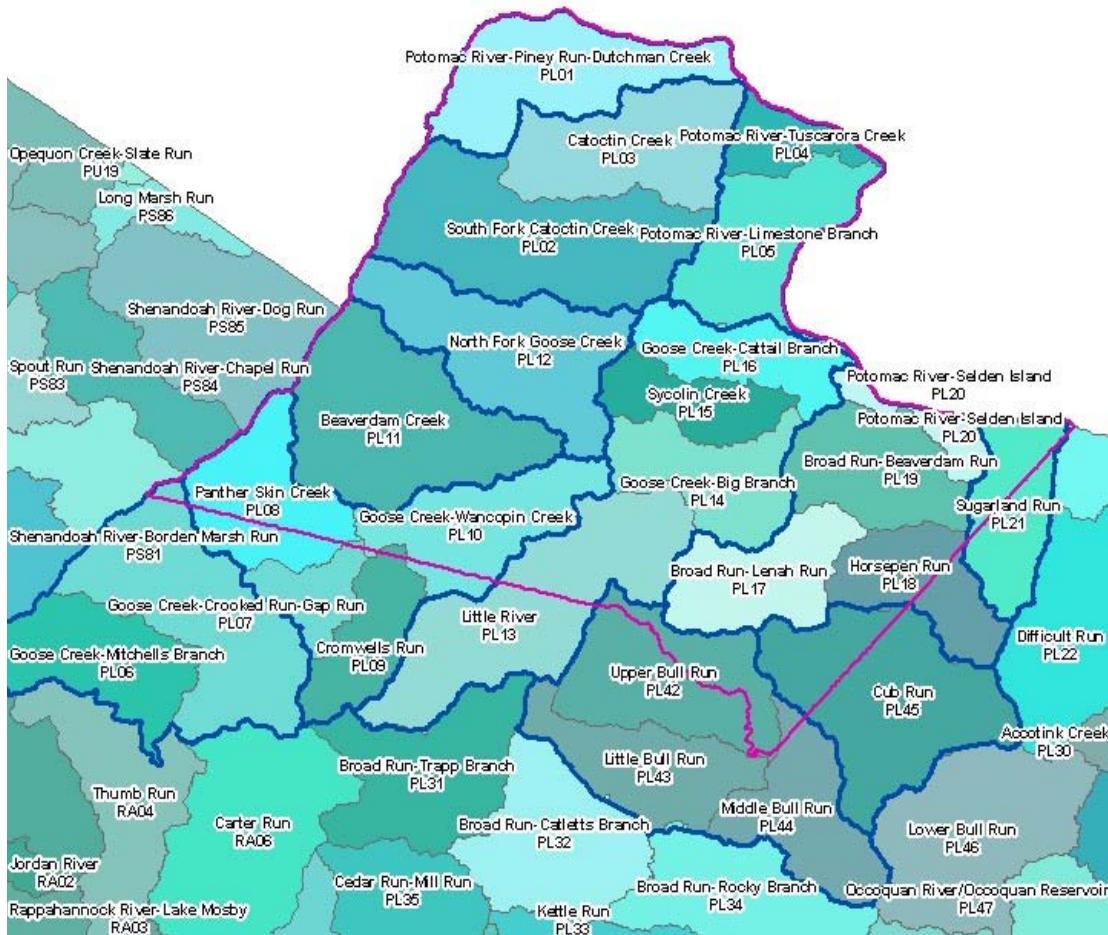


Note that the DEQ watershed numbering (A01, A02, etc.) are currently stored in the obsolete shapefile located at
O:\data\warehouse\nonCounty_Data\DEQ_Watershed_Boundaries.

The DCR watershed boundaries use a different coding. DCR offers a less detailed Level 5 boundary:



and Level 6 with more details boundary:



Although DCR published their watershed boundaries and provides GIS files ([http://www.dcr.virginia.gov/soil & water/hu.shtml](http://www.dcr.virginia.gov/soil_water/hu.shtml)), we will use the DEQ boundaries for the query.

Running the DEQ Web Query:

Start at the page http://gisweb.deq.virginia.gov/monapp/mon_query_form.cfm and select one of the twelve watersheds to cover Loudoun:

Virginia DEQ: Water Quality Monitoring - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://gisweb.deq.virginia.gov/monapp/mon_query_form.cfm

Commonwealth of Virginia Web Policy Governor of Virginia Contact Us

Virginia DEQ Home > Water Quality Monitoring Home > Monitoring Data Retrieval Home

email: Roger Stewart

Monitoring Station Data Retrieval:

Select a river basin to retrieve data for:
Basin: Select One

or,

Select a watershed to retrieve data for:
Watershed: Select One

or,

Select a hydrologic unit code (HUC):
A01R, Potomac River/Piney Run/Dutchman Creek
A02R, Catoctin Creek
A03R, Potomac River/Limestone Branch
A04L, Lake Thompson
A04R, Upper Goose Creek/Gap Run
A05R, Middle Goose Creek/Panther Skin Creek
A06R, North Fork Goose Creek
A07R, Beaverdam Creek
A08L, Beaverdam Creek Reservoir
A08R, Lower Goose Creek/Little River

Last updated: Wednesday, June 16, 2004 12:55 PM

site index help

Done Internet

(Note: Ignore Lake Thomas, A04L, as this is not in Loudoun County).

Now check the boxes on all the stations in the subwatershed:

Virginia DEQ: Water Quality Monitoring - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://gisweb.deq.virginia.gov/monapp/station_results.cfm

Commonwealth of Virginia Web Policy Governor of Virginia Contact Us

Virginia DEQ Home > Water Quality Monitoring Home > Monitoring Data Retrieval Home

email: Roger Stewart

Monitoring Station Data Retrieval:

Number of stations returned: 5

- To generate a comma delimited text file or a XML file of all the available data for a single or set of stations, select the year range, select the station(s) (up to 20) you wish to retrieve data for and optionally enter at date range at (within the year range selected) the bottom of the page
- To generate a comma delimited text file or a XML file of all the available data for all listed stations, optionally enter at date range (within the year range selected) at the bottom of the page

Select	Station ID	Stream name	Station Description	First Sample Date	Last Sample Date	Number of Samples
<input checked="" type="checkbox"/>	1ABOL002.56	Bolling Branch	Justice Lane	2001-08-22 11:40:00.0	2005-04-05 09:15:00.0	251
<input checked="" type="checkbox"/>	1ACRA000.42	CROOKED RUN	Rt. # 623 (Jacksontown Rd)	2001-09-20 12:50:00.0	2003-06-19 12:30:00.0	172
<input checked="" type="checkbox"/>	1AGAR002.24	Gap Run	Rt. # 623 (Rokey Rd)	2001-08-22 10:40:00.0	2003-06-19 09:45:00.0	234
<input checked="" type="checkbox"/>	1AGO0044.36	GOOSE CREEK	Rt. # 17	1974-09-09 14:00:00.0	2005-12-12 13:15:00.0	4387
<input checked="" type="checkbox"/>	1AGO0046.37	Goose Creek	Rt. # 724 (Sage Rd)	2001-09-20 13:20:00.0	2002-07-08 12:00:00.0	109

Input Date Range for retrieval to file
Start date to Finish date
mm/dd/yyyy mm/dd/yyyy

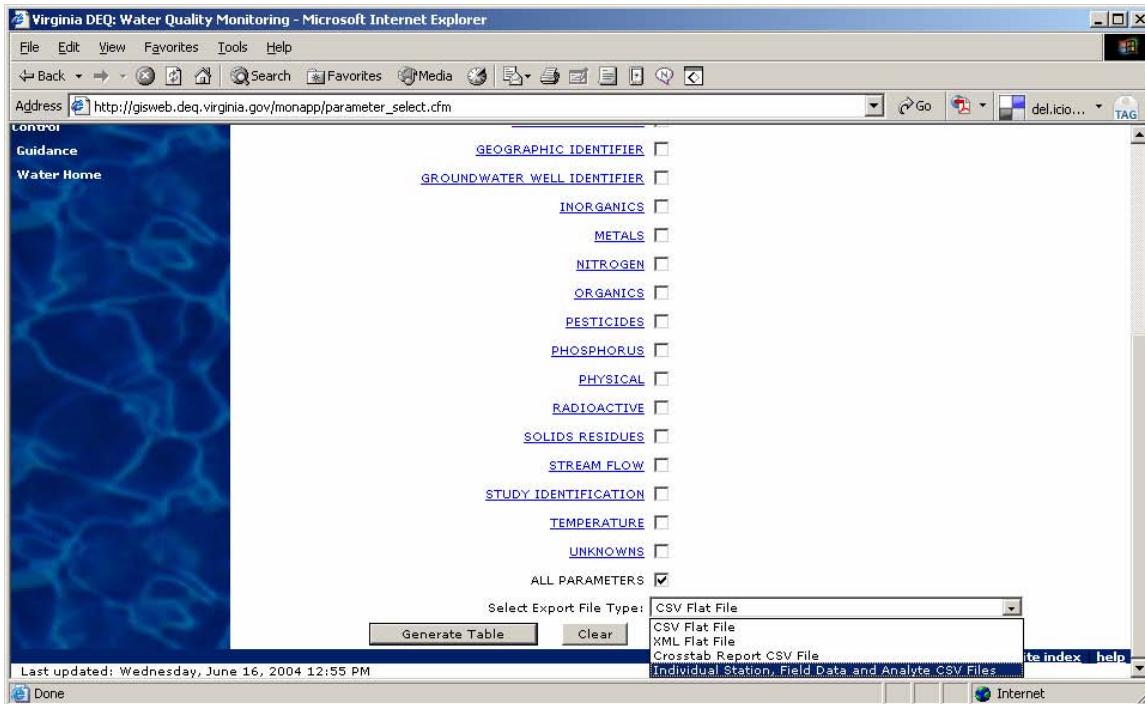
Done Internet

choosing "Select Parameters" button at bottom of the screen.

With the parameter screen, scroll down at check “All Paramaters”.

Change the “Select Export File Type” to “Individual Station, Field Data and Analyte Data CSV”.

Note that “analyte” means water quality analysis performed in the lab versus the field using probes and meters. CSV is comma-separated variable.



Now click on the button “Generate Table”:

We need right click and save three files:

1. Station CSV File
2. Field Date CSV File
3. Analyte CSV File

To disk:

Virginia DEQ: Water Quality Monitoring - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://gisweb.deq.virginia.gov/monapp/table_export.cfm Go del.icio... TAG

Commonwealth of Virginia Web Policy Governor of Virginia Contact Us

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Search DEQ Go Advanced search

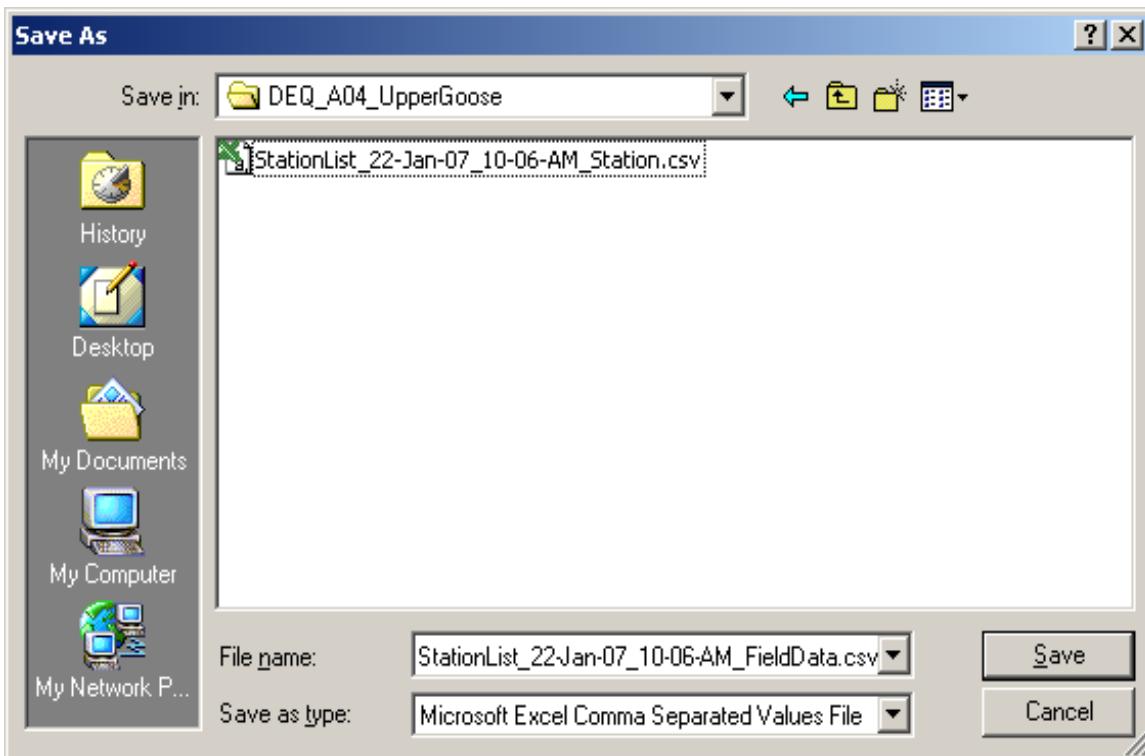
Virginia DEQ Home > Water Quality Monitoring Home > Monitoring Data Retrieval Home email: [Roger Stewart](#)

Water Quality
Monitoring Home
Surface Water
Monitoring
Biological Monitoring
Fish Tissue Monitoring
Chesapeake Bay
Monitoring
Citizen Monitoring

Monitoring Station Data Retrieval:

- Right click [HERE](#), and click "Save Target As" to download your Station CSV File
- Right click [HERE](#), and click "Save Target As" to download your Field Date CSV File
- Right click [HERE](#), and click "Save Target As" to download your Analyte CSV File
- Click [HERE](#) to perform another query

http://www.deq.virginia.gov/ Internet



Review of Data:

The station data tables are downloaded for completeness, but not really needed we already have a feature class with these locations:

	A	B	C	D	E	F	G	H	I
1	Station_ID	Station_Des Alias		FIC_Count	FIC_State	Rec_Code	Latitude_D	Latitude_M	Latitude_S
2	1ABOL002.56	Justice La--		61	51	NVRO	38	53	16.79
3	1ACRA000.42	Rt. #623 (--		61	51	NVRO	38	55	6.75
4	1AGAR002.24	Rt. #623 (--		61	51	NVRO	38	56	36.67
5	1AGO0044.36	Rt. # 17 --		61	51	NVRO	38	54	51
6	1AGO0046.37	Rt. # 724 (--		61	51	NVRO	38	54	20.23
7									
8									
9									

The “Field” and Analyte” data tables are needed.

	A	B	C	D	E	F	G	H	I
1	Station_ID	Collection_T	Sample_ID	Percent_F	Depth	Field_pH	DO_Probe	DO_Winkl	Temp_Cels
2	1ABOL002.56	40:00.0	1	50	0.3	7.04	6.91	--	20.9 --
3	1ABOL002.56	40:00.0	2	50	0.3	7.04	6.91	--	20.9 --
4	1ABOL002.56	40:00.0	3	50	0.3	7.04	6.91	--	20.9 --
5	1ABOL002.56	40:00.0	4	50	0.3	7.04	6.91	--	20.9 --
6	1ABOL002.56	40:00.0	5	50	0.3	7.04	6.91	--	20.9 --
7	1ABOL002.56	45:00.0	1	50	0.3	7.12	9.14	--	12.84 --
8	1ABOL002.56	45:00.0	2	50	0.3	7.12	9.14	--	12.84 --
9	1ABOL002.56	45:00.0	3	50	0.3	7.12	9.14	--	12.84 --

and

Note the field “Collection_Date_Time” actually contains date and time information although not initially display when housed in MS Excel. We’ll adjust for this later.

Merging the Data Tables:

There are many way to merge the twelve tables. Probably the most simple is to use DOS batch files. Below is the listing of “copy_merge2.bat” file.

```
REM Utility to copy and merge DEQ water quality data downloaded into separate folders and merge into one

del FieldData.csv
copy D:\DEQ_Water_Quality\DEQ_A01R_PotPieNeyDutchman\StationList*FieldData.csv 1.csv
copy D:\DEQ_Water_Quality\DEQ_A02R_Catocin\StationList*FieldData.csv + 1.csv 2.csv
copy D:\DEQ_Water_Quality\DEQ_A03R_PotLimestone\StationList*FieldData.csv + 2.csv 3.csv
copy D:\DEQ_Water_Quality\DEQ_A04R_UpperGooseGap\StationList*FieldData.csv + 3.csv 4.csv
copy D:\DEQ_Water_Quality\DEQ_A05R_MiddleGoosePantherSkin\StationList*FieldData.csv + 4.csv 5.csv
copy D:\DEQ_Water_Quality\DEQ_A06R_NorthfkGoose\StationList*FieldData.csv + 5.csv 6.csv
copy D:\DEQ_Water_Quality\DEQ_A07R_Beaverdam\StationList*FieldData.csv + 6.csv 7.csv
copy D:\DEQ_Water_Quality\DEQ_A07L_BeaverdamReservoir\StationList*FieldData.csv + 7.csv 8.csv
copy D:\DEQ_Water_Quality\DEQ_A08R_LowerGooseLittle\StationList*FieldData.csv + 8.csv 9.csv
copy D:\DEQ_Water_Quality\DEQ_A09R_PotBroadRun\StationList*FieldData.csv + 9.csv 10.csv
copy D:\DEQ_Water_Quality\DEQ_A10R_SugarlandRun\StationList*FieldData.csv + 10.csv 11.csv
copy D:\DEQ_Water_Quality\DEQ_A21R_UpperBullLittleBull\StationList*FieldData.csv + 11.csv 12.csv
copy D:\DEQ_Water_Quality\DEQ_A22R_CubRun\StationList*FieldData.csv + 12.csv FieldData.csv
Del 1.csv, 2.csv, 3.csv, 4.csv, 5.csv, 6.csv, 7.csv, 8.csv, 9.csv, 10.csv, 11.csv, 12.csv

del Station.csv
copy D:\DEQ_Water_Quality\DEQ_A01R_PotPieNeyDutchman\StationList*Station.csv 1.csv
copy D:\DEQ_Water_Quality\DEQ_A02R_Catocin\StationList*Station.csv + 1.csv 2.csv
copy D:\DEQ_Water_Quality\DEQ_A03R_PotLimestone\StationList*Station.csv + 2.csv 3.csv
copy D:\DEQ_Water_Quality\DEQ_A04R_UpperGooseGap\StationList*Station.csv + 3.csv 4.csv
copy D:\DEQ_Water_Quality\DEQ_A05R_MiddleGoosePantherSkin\StationList*Station.csv + 4.csv 5.csv
copy D:\DEQ_Water_Quality\DEQ_A06R_NorthfkGoose\StationList*Station.csv + 5.csv 6.csv
copy D:\DEQ_Water_Quality\DEQ_A07R_Beaverdam\StationList*Station.csv + 6.csv 7.csv
copy D:\DEQ_Water_Quality\DEQ_A07L_BeaverdamReservoir\StationList*Station.csv + 7.csv 8.csv
copy D:\DEQ_Water_Quality\DEQ_A08R_LowerGooseLittle\StationList*Station.csv + 8.csv 9.csv
copy D:\DEQ_Water_Quality\DEQ_A09R_PotBroadRun\StationList*Station.csv + 9.csv 10.csv
copy D:\DEQ_Water_Quality\DEQ_A10R_SugarlandRun\StationList*Station.csv + 10.csv 11.csv
copy D:\DEQ_Water_Quality\DEQ_A21R_UpperBullLittleBull\StationList*Station.csv + 11.csv 12.csv
copy D:\DEQ_Water_Quality\DEQ_A22R_CubRun\StationList*Station.csv + 12.csv Station.csv
Del 1.csv, 2.csv, 3.csv, 4.csv, 5.csv, 6.csv, 7.csv, 8.csv, 9.csv, 10.csv, 11.csv, 12.csv

del Analyte.csv
copy D:\DEQ_Water_Quality\DEQ_A01R_PotPieNeyDutchman\StationList*Analyte.csv 1.csv
copy D:\DEQ_Water_Quality\DEQ_A02R_Catocin\StationList*Analyte.csv + 1.csv 2.csv
copy D:\DEQ_Water_Quality\DEQ_A03R_PotLimestone\StationList*Analyte.csv + 2.csv 3.csv
copy D:\DEQ_Water_Quality\DEQ_A04R_UpperGooseGap\StationList*Analyte.csv + 3.csv 4.csv
copy D:\DEQ_Water_Quality\DEQ_A05R_MiddleGoosePantherSkin\StationList*Analyte.csv + 4.csv 5.csv
copy D:\DEQ_Water_Quality\DEQ_A06R_NorthfkGoose\StationList*Analyte.csv + 5.csv 6.csv
copy D:\DEQ_Water_Quality\DEQ_A07R_Beaverdam\StationList*Analyte.csv + 6.csv 7.csv
copy D:\DEQ_Water_Quality\DEQ_A08R_LowerGooseLittle\StationList*Analyte.csv + 7.csv 8.csv
copy D:\DEQ_Water_Quality\DEQ_A09R_PotBroadRun\StationList*Analyte.csv + 8.csv 9.csv
copy D:\DEQ_Water_Quality\DEQ_A10R_SugarlandRun\StationList*Analyte.csv + 9.csv 10.csv
copy D:\DEQ_Water_Quality\DEQ_A21R_UpperBullLittleBull\StationList*Analyte.csv + 10.csv 11.csv
copy D:\DEQ_Water_Quality\DEQ_A22R_CubRun\StationList*Analyte.csv + 11.csv 12.csv
copy D:\DEQ_Water_Quality\DEQ_A22R_CubRun\StationList*Analyte.csv + 12.csv Analyte.csv
Del 1.csv, 2.csv, 3.csv, 4.csv, 5.csv, 6.csv, 7.csv, 8.csv, 9.csv, 10.csv, 11.csv, 12.csv
```

At this point, we need to load to MS Access as the “Analyte” table contains more than 84,000 records which is more then the 64K limit of Excel rows.

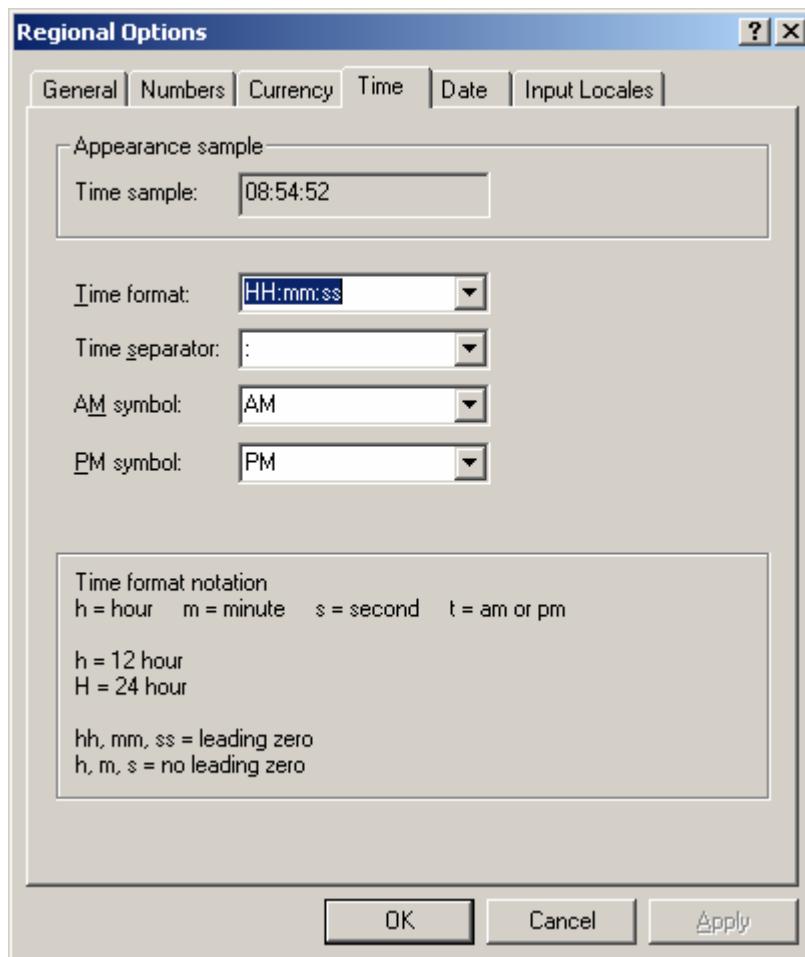
Loading the Data Tables:

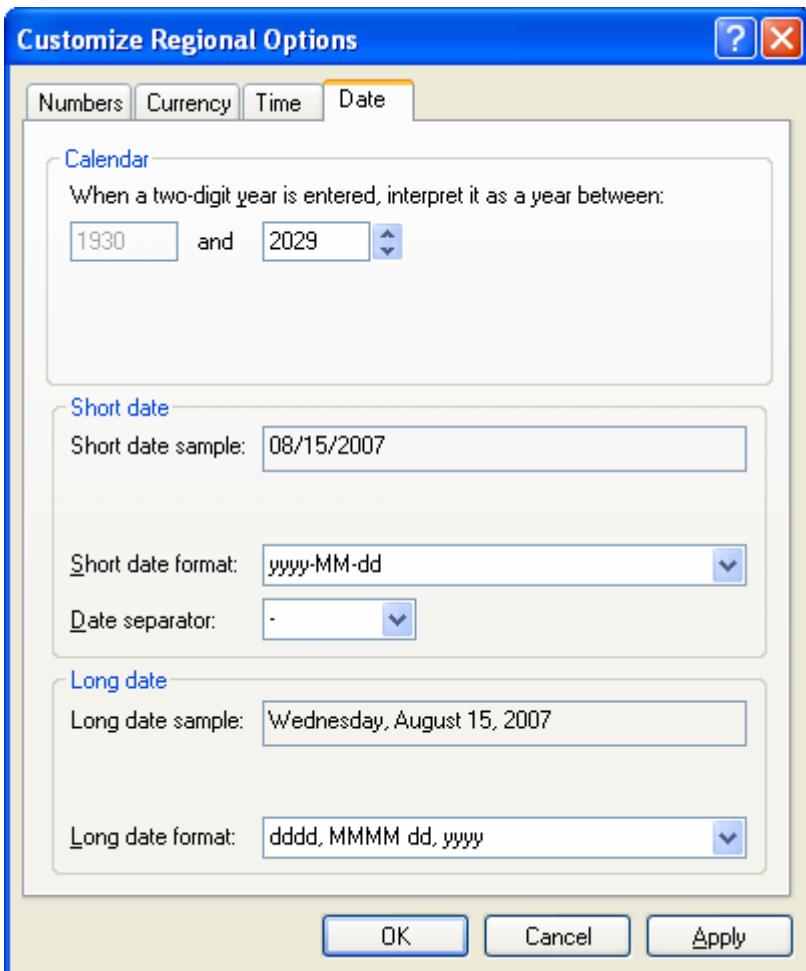
Using Data Load template: You start with the file “DEQ_Jan_2007_Template.mdb “ and copy this to “DEQ_Jan_2007_Data_Load.lmdb”.

before we do this, we need to manually edit the .csv files coming from DEQ.

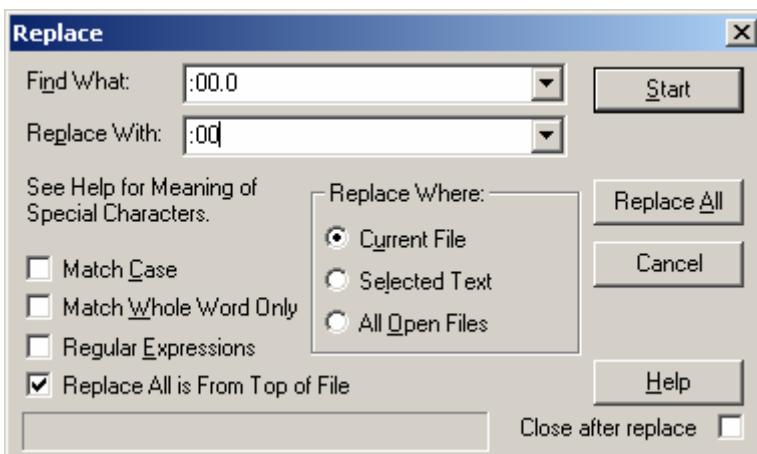
The typical date/time format is: "1974-10-07 11:30:00.0" and we need to drop the ending ".0" from time to have "1974-10-07 11:30:00"

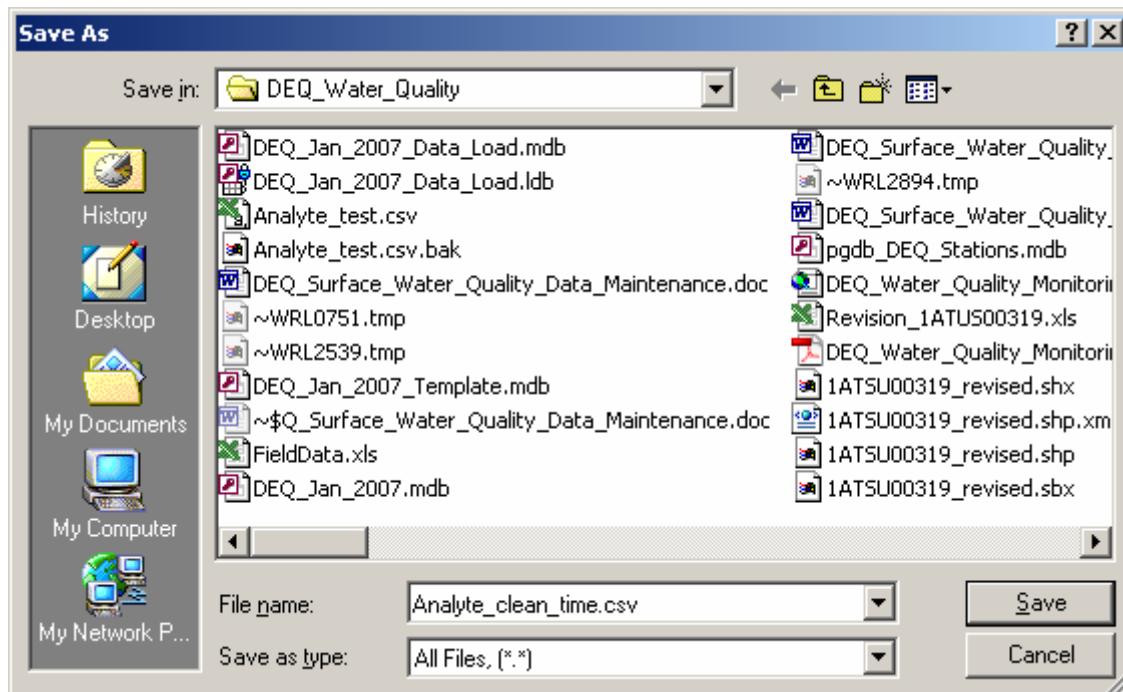
This should be consistent with local Windows Control Panel > Regional Setting which uses the 24 hours clock



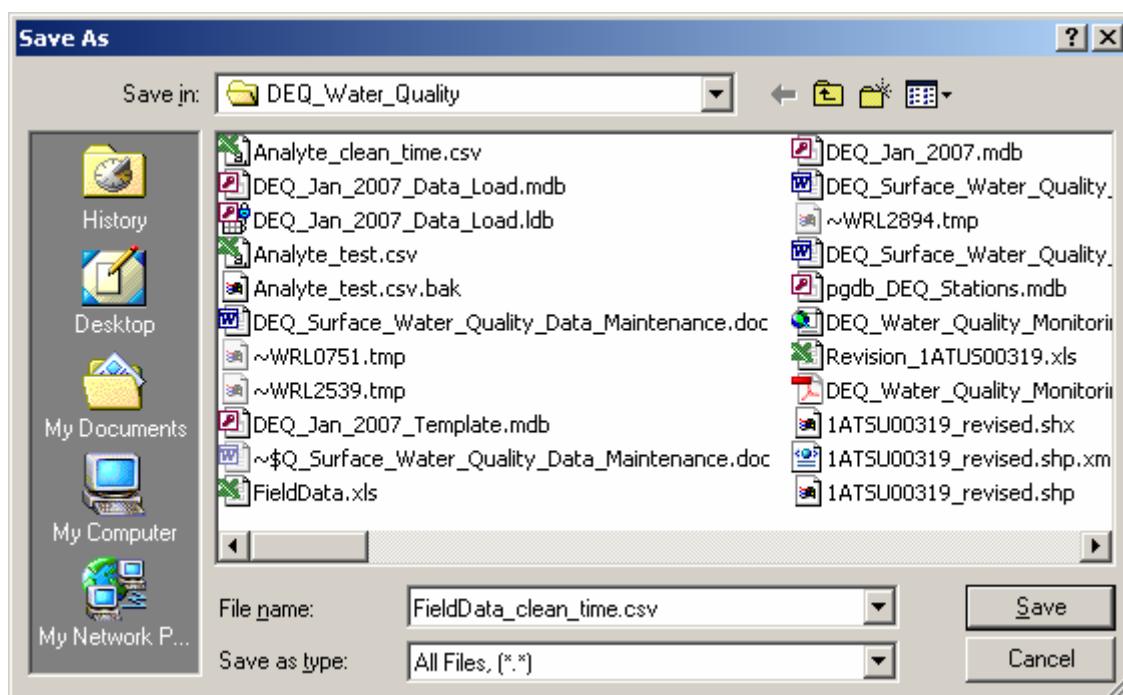


Now manually edit all records replacing:





also do this for field data



In the table properties, we should have a “General Time” and input mask as follows

Analyte : Table

	Field Name	Data Type	Description
	Station_ID	Text	
►	Collection_Date_Time	Date/Time	
	Sample_ID	Text	
	Parameter_Code	Text	
	Parameter_Name	Text	
	Value	Number	
	Comment_Code	Text	
	Comment_Description	Text	

Field Properties

General | Lookup |

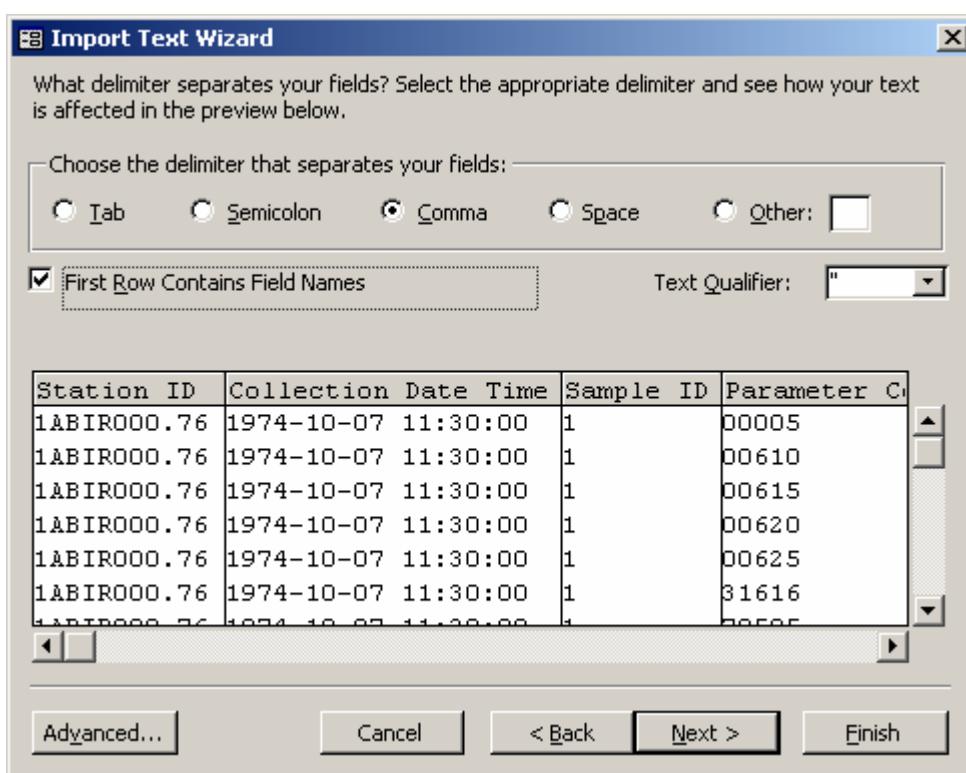
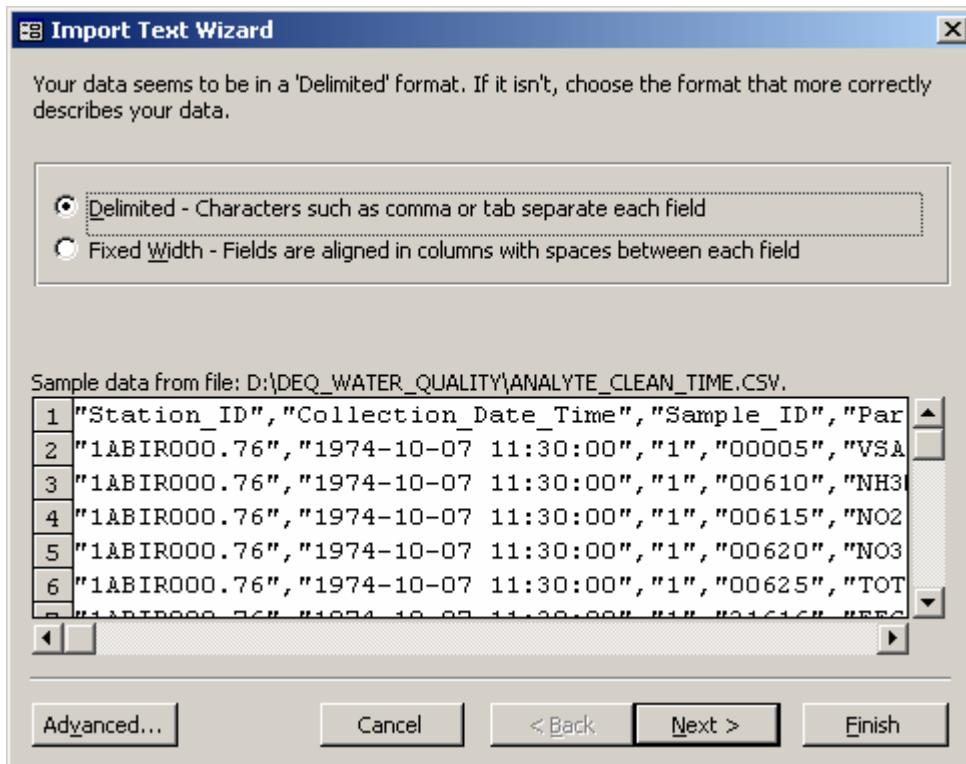
Format	General Date
Input Mask	0000-00-00 00:00:00;;_
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Indexed	No
IME Mode	No Control
IME Sentence Mode	None

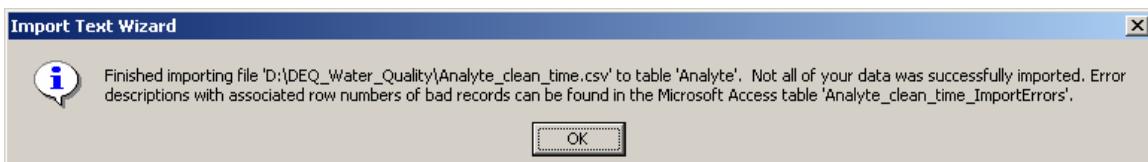
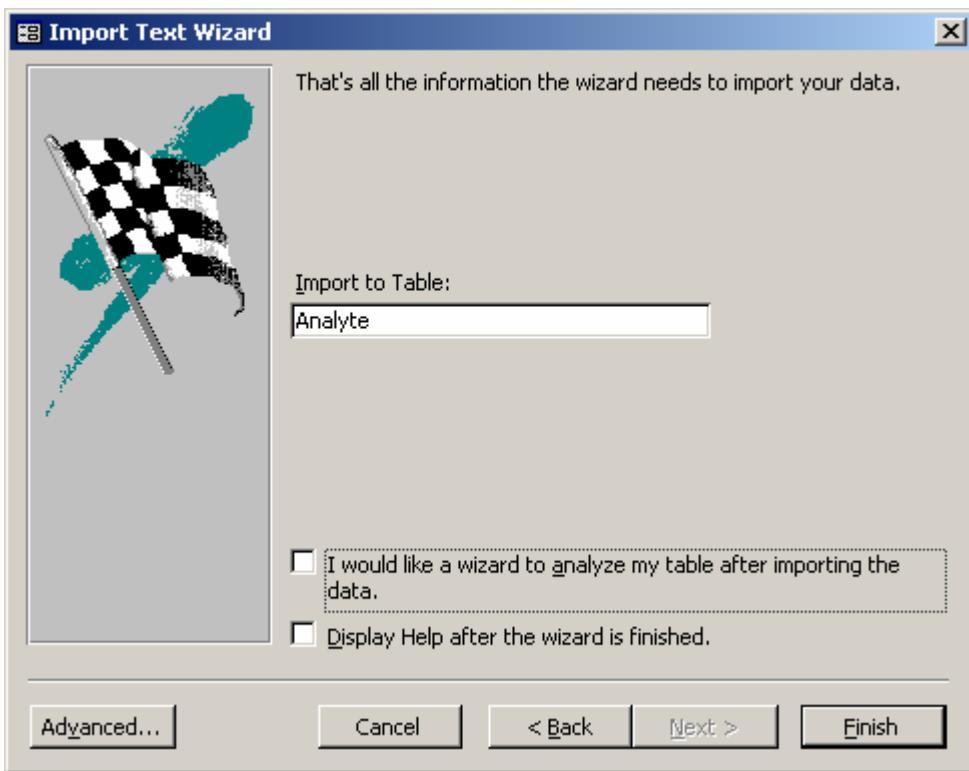
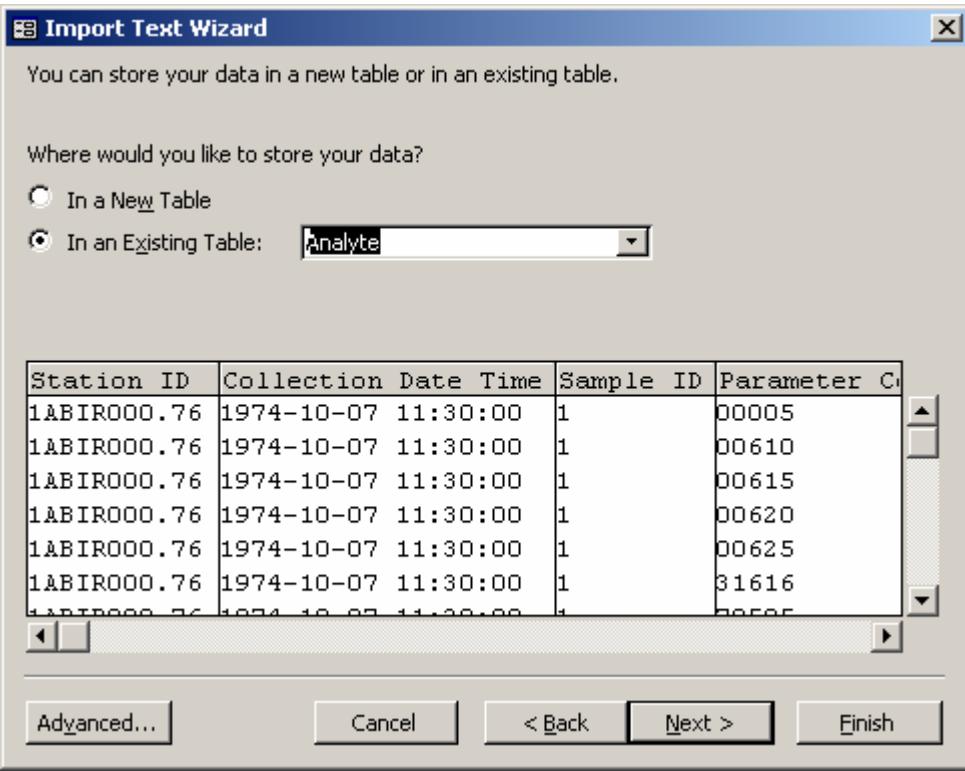
A pattern for all data to be entered in this field

Design view. F6 = Switch panes. F1 = Help.

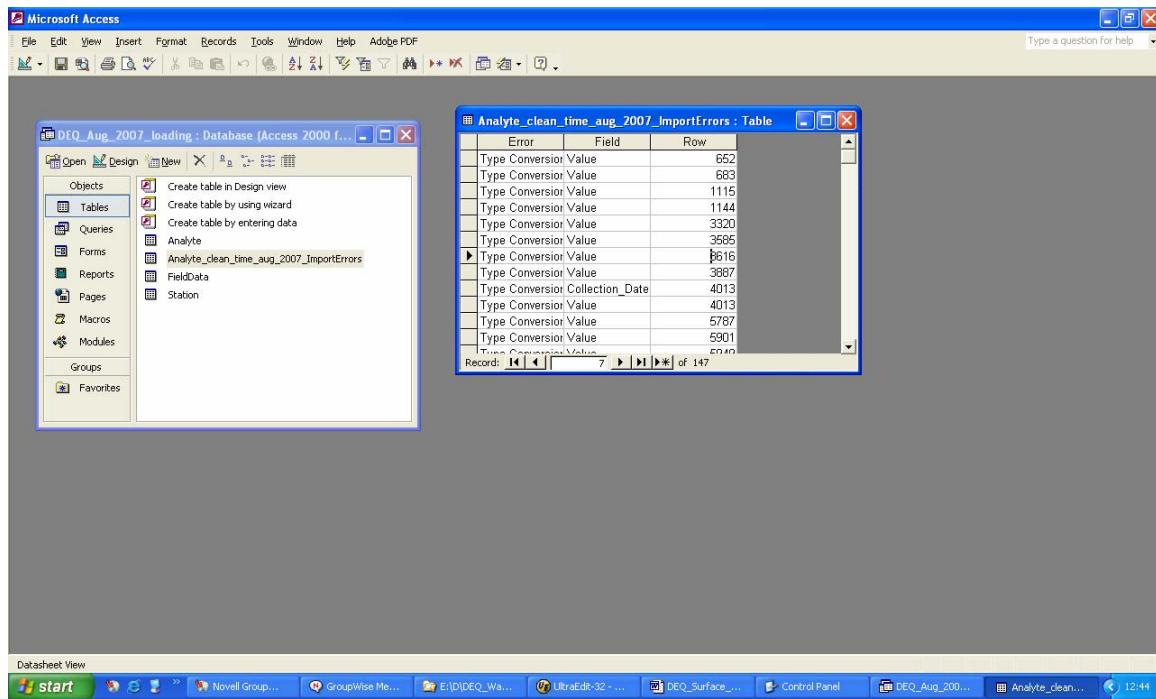
The screenshot shows the Microsoft Access application window with the title bar 'Microsoft Access'. Below the menu bar, there's a toolbar with various icons. The main area displays the 'Analyte : Table' design view. At the top of the table grid, there are three columns: 'Field Name', 'Data Type', and 'Description'. Below this header, there are nine rows of data. The first row has a small icon before 'Collection_Date_Time'. The second column contains field names like 'Station_ID', 'Collection_Date_Time', 'Sample_ID', etc. The third column lists their data types: 'Text', 'Date/Time', 'Text', etc. The fourth column is empty. Below the table, a section titled 'Field Properties' is open, showing properties for the 'Collection_Date_Time' field. The 'Format' property is set to 'General Date'. The 'Input Mask' property is set to '0000-00-00 00:00:00;;_'. A tooltip 'A pattern for all data to be entered in this field' is visible next to the input mask. Other properties listed include 'Caption', 'Default Value', 'Validation Rule', 'Validation Text', 'Required' (set to No), 'Indexed' (set to No), 'IME Mode' (set to No Control), and 'IME Sentence Mode' (set to None). At the bottom of the window, there's a status bar with the text 'Design view. F6 = Switch panes. F1 = Help.'

Now Get External Data > Import





There will be some data errors:

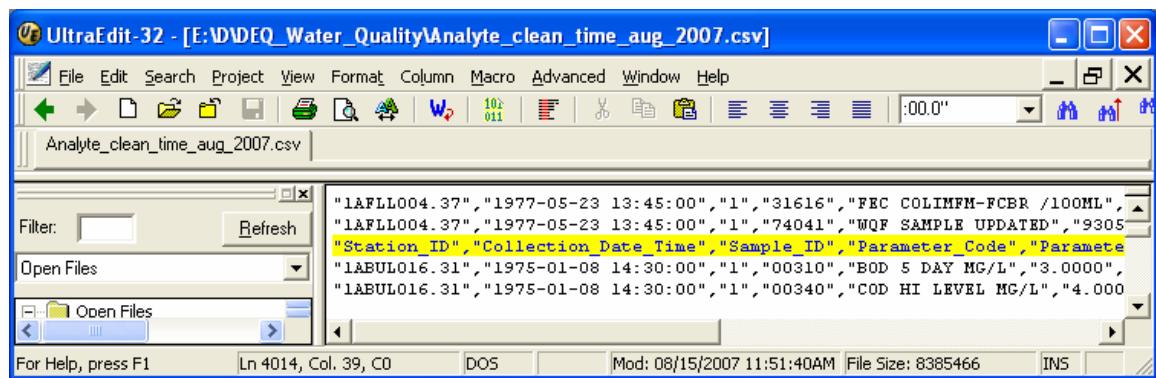


For example records such as:

"PHEOPHTN RATIO SPECTRO","--","O","--"

cause a problem because “Value” is “--”

There are also date value problems.....



because of extraneous header records not being removed after copying together the files, but this is OK.

This occurs when the .csv file has blanks such as:

UltraEdit-32 - [D:\DEQ_Water_Quality\Analyte_clean_time.csv]

File Edit Search Project View Format Column Macro Advanced Window Help

Analyte_clean_time.csv

Filter: Refresh

Open Files D:\DEQ_Water_Quality\Analyte_clean_time.csv

12", "CHLRPHYL B UG/L", "0.5000", "U", "--"
 14", "CHLRPHYL C UG/L", "0.5000", "U", "--"
 18", "PHEOPHTN A UG/L", "0.5000", "U", "--"
19", "PHEOPHTN RATIO SPECTRO", "--", "O", "--"
 BX", "Chlorophyll 630B (Before HCL)", "0.0040", "--",
 BX", "Chlorophyll 647B (Before HCL)", "0.0046", "--",
 BX", "Chlorophyll 664B (Before HCL)", "0.0136", "--",
 AX", "Chlorophyll 665A (After HCL)", "0.0106", "--",
 D7", "PHOS-T ORTHO MG/L P", "0.0200", "U", "--"

For Help, press F1 Ln 653, Col. 75, C0 DOS Mod: 2007-02-21 08:56:32 File Size: 8171

Microsoft Access

File Edit View Insert Format Records Tools Window Help Type a question for help

Analyte : Table

	Parameter_Name	Value	Comment_Code	Comment_Desc
	PHOS-TOT MG/L P	0.03	--	--
	TOT HARD CACO3 MG/L	125	--	--
	FEC COLIMFM-FCBR /100ML	100	U	--
	CHLRPHYL A UG/L	0.582	--	--
	CHLRPHYL A UG/L CORRECTED	0.84	--	--
	CHLRPHYL B UG/L	0.5	U	--
	CHLRPHYL C UG/L	0.5	U	--
	PHEOPHTN A UG/L	0.5	U	--
▶	PHEOPHTN RATIO SPECTRO	10	--	--
	Chlorophyll 630B (Before HCL)	0.004	--	--
	Chlorophyll 647B (Before HCL)	0.0046	--	--
	Chlorophyll 664B (Before HCL)	0.0136	--	--
	Chlorophyll 665A (After HCL)	0.0106	--	--
	PHOS-T ORTHO MG/L P	0.02	U	--
	VOL WAT FILTERED LITERS	0.3	--	--
	Chlorophyll 750A (After HCL)	0.0082	--	--
	Chlorophyll 750B (Before HCL)	0.0065	--	--
	Cell Path (cm)	5	--	--
	Chlorophyll Extract Volume (ml)	10	--	--
	TURB TRBIDMTRHACH FTU	4.8	--	--
	CNDUCTVY AT 25C MICROMHO	388	--	--

Record: 652 of 85950

Datasheet View

This is OK.

A second problem occurs when tabs were merged together resulting in redundant header records in the .csv file such as:

	Error	Field	Row
▶	Type Conversion	Value	652
	Type Conversion	Value	683
	Type Conversion	Value	3212
	Type Conversion	Value	3477
	Type Conversion	Value	3508
	Type Conversion	Value	3779
	Type Conversion	Collection_Date	3935
	Type Conversion	Value	3935
	Type Conversion	Value	5667
	Type Conversion	Collection_Date	8247
	Type Conversion	Value	8247
	Type Conversion	Value	12823
	Type Conversion	Value	12824
	Type Conversion	Value	12825
	Type Conversion	Value	12826
	Type Conversion	Value	12827
	Type Conversion	Value	12841
	Type Conversion	Collection_Date	13461
	Type Conversion	Value	13461
	Type Conversion	Value	19293
	Type Conversion	Value	23601

This is OK.

```

"1ALID002.60","1980-08-19 14:05:00","1","01068","I"
"1ALID002.60","1980-08-19 14:05:00","1","01093","I"
"1ALID002.60","1980-08-19 14:05:00","1","31616","I"
"1ALID002.60","1980-08-19 14:05:00","1","71921","I
"1ALID002.60","1980-08-19 14:05:00","1","74041","I"
"Station_ID","Collection_Date_Time","Sample_ID","I"
"1ABUL016.31","1975-01-08 14:30:00","1","00310","I"
"1ABUL016.31","1975-01-08 14:30:00","1","00340","I"
"1ABUL016.31","1975-01-08 14:30:00","1","00403","I"

```

Now clean-up the repeated headings generated while merging the files: Sort by Station ID by right clicking on column header.

ID	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
82672	1AXKR000.77	2005-04-04 14:01	01057	THALLIUMTL,DI	0.1000	U	--	
82673	1AXKR000.77	2005-04-04 14:01	01065	NICKEL NI,DISSE	0.3000	--	--	
82674	1AXKR000.77	2005-04-04 14:01	01075	SILVER AG,DIS	0.1000	U	--	
82675	1AXKR000.77	2005-04-04 14:01	01090	ZINC ZN,DISS	1.9000	--	--	
82676	1AXKR000.77	2005-04-04 14:01	01095	ANTIMONYSB,I	0.5000	U	--	
82677	1AXKR000.77	2005-04-04 14:01	01106	ALUMINUM AL,	3.9000	--	--	
82669	1AXKR000.77	2005-04-04 14:01	01046	IRON FE,DISS	52.0000	--	--	
82701	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
44063	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
44572	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
47154	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
23625	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
60267	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
51437	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
8247	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
3935	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
13461	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
65421	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
66713	Station_ID	Collection_Date	Sample_ID	Parameter_Cod	Parameter_Narr	Value	Comment_Code	Corr
*	(AutoNumber)							

Delete these extra records.

There are also problems with importing null values "--" for FieldData DO_probe and others and in Stations for Strahler_order and Shreve_Order as these are nulls.

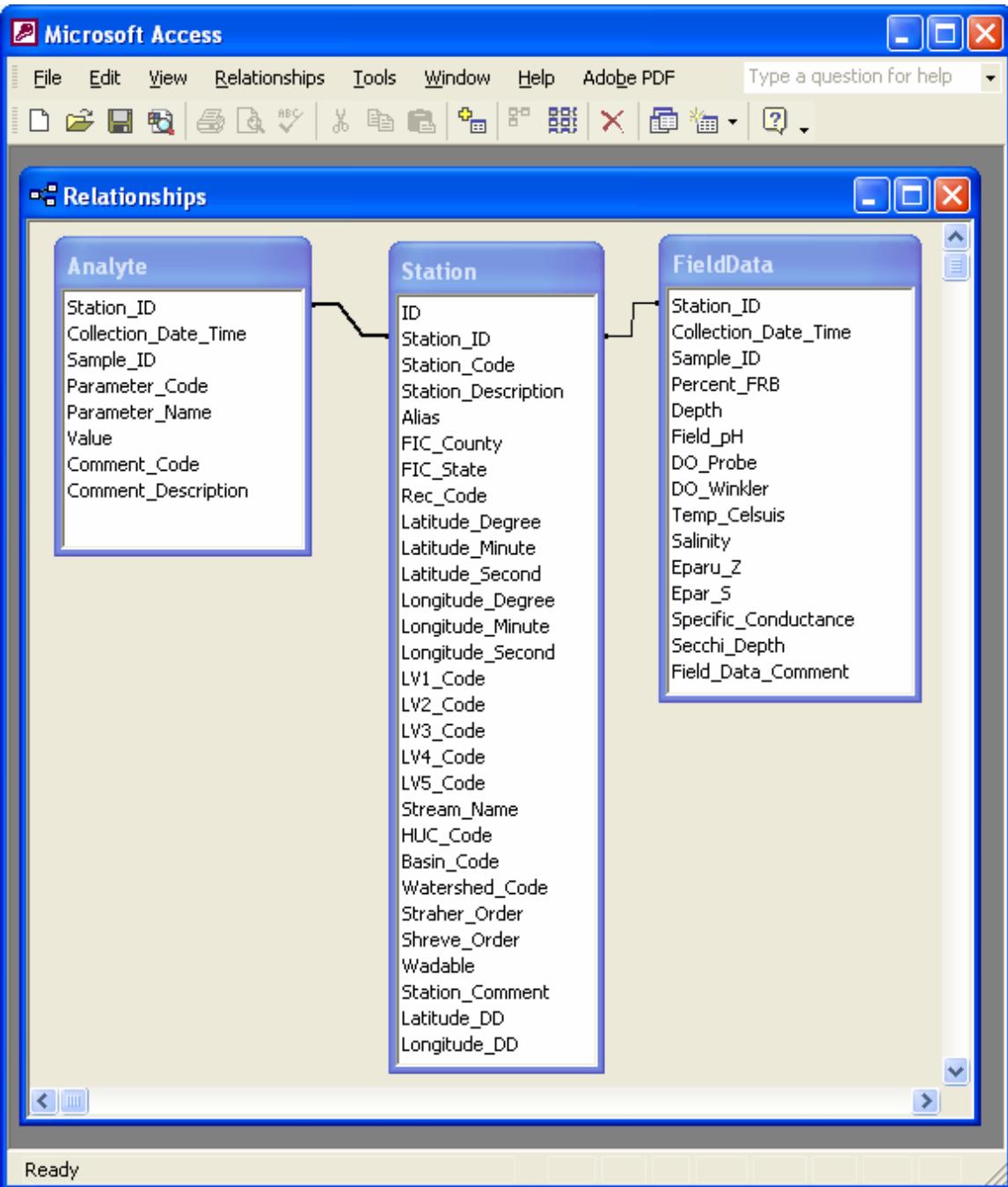
In preparation for Stographics, we need to have a number for the station. We can't use text values.

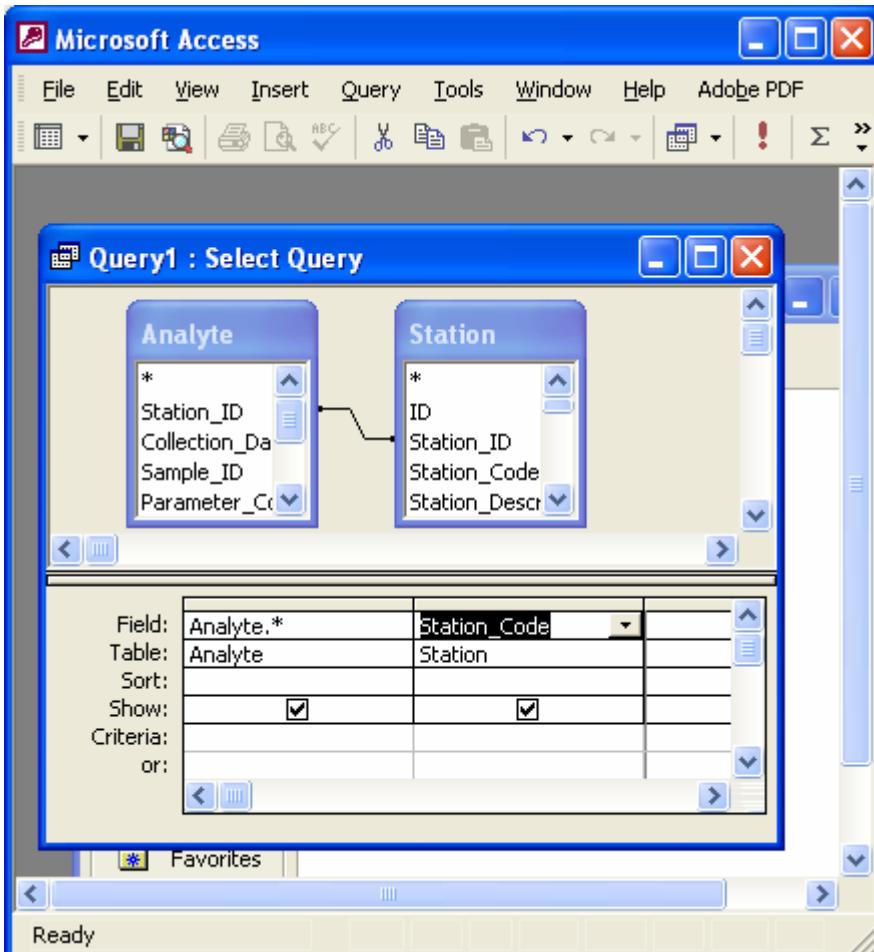
To address this, add a sequence number to the Station table

The screenshot shows the Microsoft Access application window with the title bar "Microsoft Access". Below the title bar is a menu bar with options: File, Edit, View, Insert, Tools, Window, Help, and Adobe PDF. A toolbar with various icons follows. The main area displays a table named "Station : Table" in design view. The table has three columns: "Field Name", "Data Type", and "Description". The rows list fields such as ID (AutoNumber), Station_ID (Text), Station_Code (Number), Station_Description (Text), Alias (Text), FIC_County (Number), FIC_State (Number), Rec_Code (Text), Latitude_Degree (Number), Latitude_Minute (Number), Latitude_Second (Number), Longitude_Degree (Number), Longitude_Minute (Number), Longitude_Second (Number), LV1_Code (Text), LV2_Code (Text), LV3_Code (Text), LV4_Code (Text), LV5_Code (Text), Stream_Name (Text), and HUC_Code (Text). The "Station_Code" field is currently selected, showing its properties in the "Field Properties" pane below. The "General" tab is selected, showing settings like Field Size (Long Integer), Format (Auto), Decimal Places (Auto), Input Mask (empty), Caption (empty), Default Value (0), Validation Rule (empty), Validation Text (empty), Required (No), and Indexed (Yes (Duplicates OK)). At the bottom of the window, a status bar reads "Design view. F6 = Switch".

Populate the first few values and then using down arrow, the rest will fill in automatically.

No join Analyte to Station and “Make Table”





Do similar for FieldData

We now have Analyte and FieldData with a numerical field for Station_Code.

Status:

As of 1/23/2007, DEQ (Roger Stewart) indicated that preferred data type designations and definitions would not be forthcoming and that we should wait for the new Oracle-based system is developed.

Other Reference:

Separate memo will be created on relating time-series tables (similar to USGS Stream flow table relate).

Legend

— Major Drains

DEQ_Surface_Water_Station_Analyte_Count

Analyte_Sample_Count.NumberOfDups

- 4 - 172
 - 173 - 423
 - 424 - 1321
 - 1322 - 3216
 - 3217 - 6972

USGS Stream Gages

County

DEQ_Sum

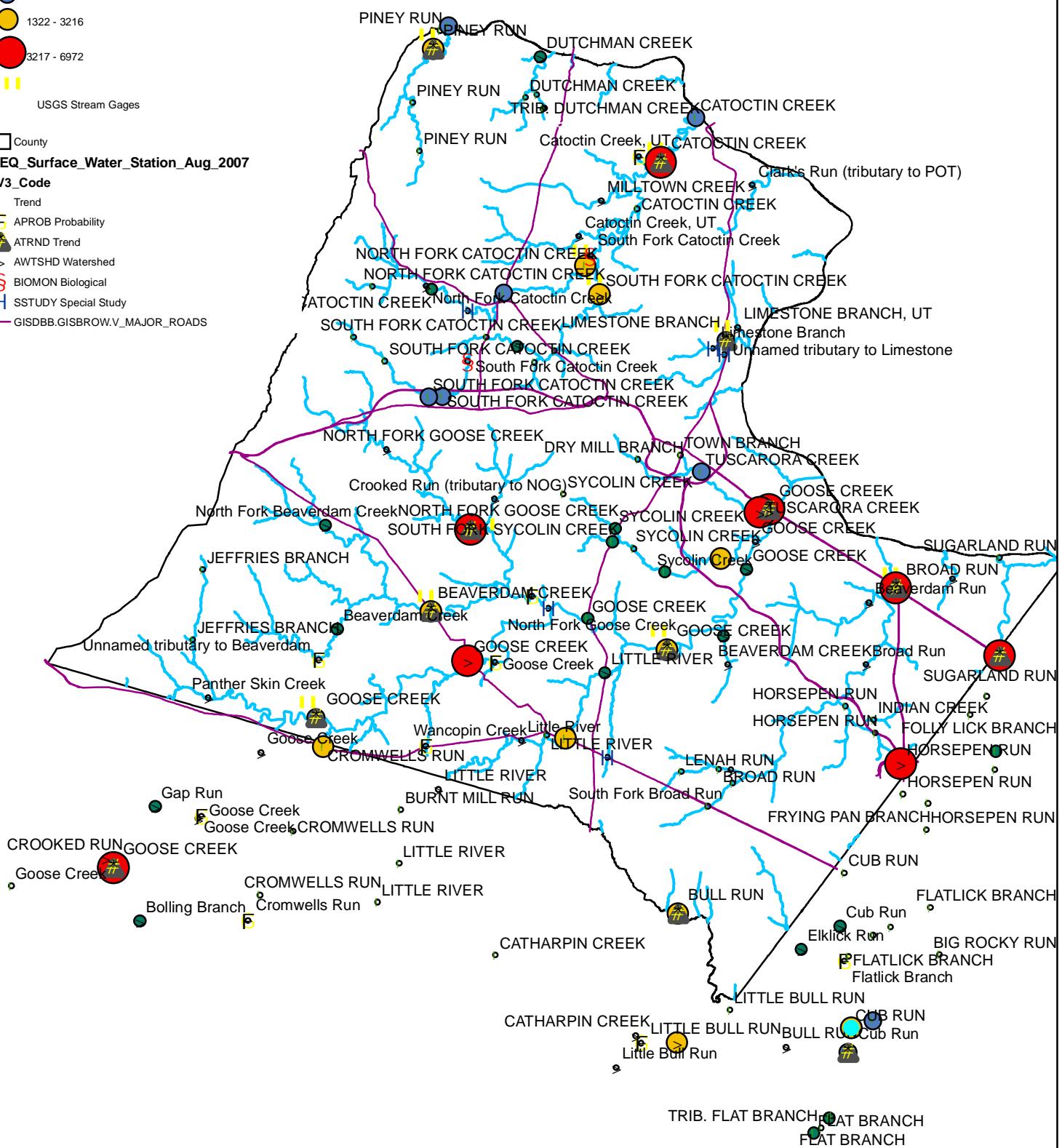
Lv3_Code

ARROB Probability

 APRUB Probability
 ATRND Trend

AWTSHD Watershed

- > AWT SHD Watershed
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Relating Data in USGS NAWQA

David Ward
December 8, 2006

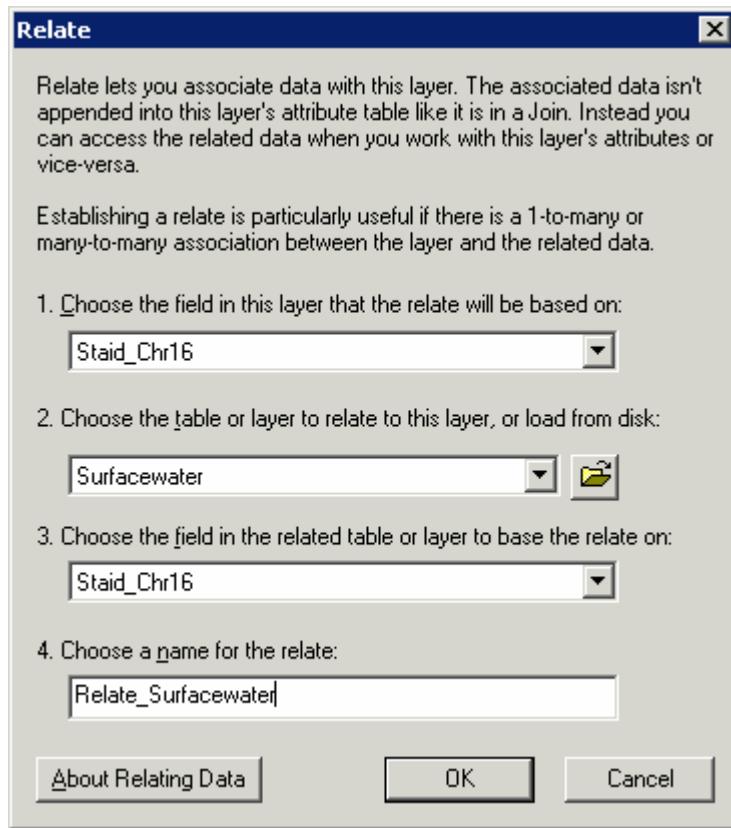
The station identification number from web query results in the field Staid being a Double. This first needs to be converted to a character string of length 16 in the feature class “Stations” and the two table of time series data “Surfacewater” and “Groundwater”.

Now these can be related in a one-to-many relationship. For each station there are numerous water chemistry measurements.

One can manually create the relate and store in the .mxd file, or one can use ArcToolBox to create a relationship class. If you create the relate in the .mxd, one needs to save as layer file such that others may use the data in the same way. Preferably the relate is stored as a relationship class in pgdb.

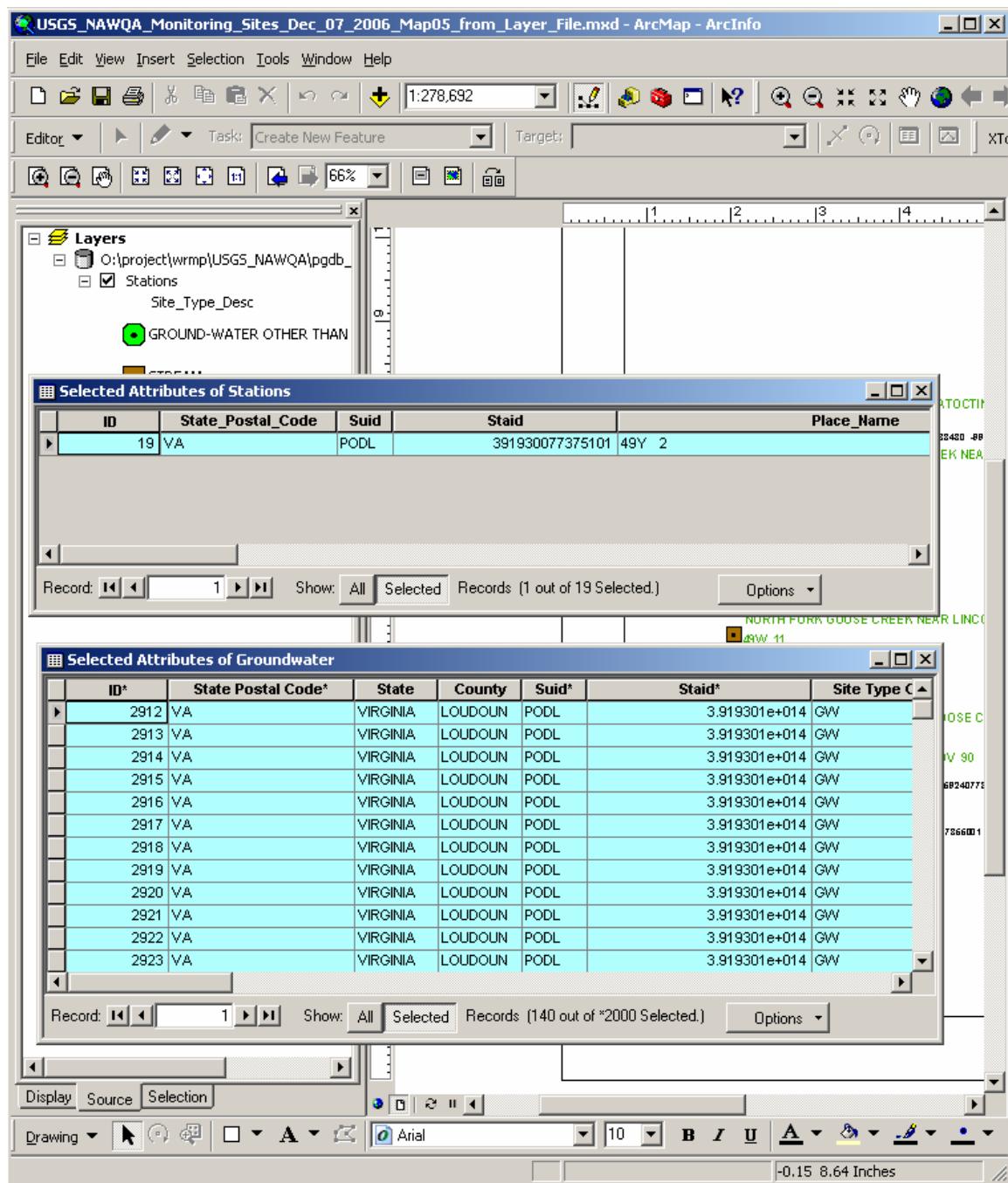
Step 1: First examine relating directly within ArcMap.

Select the “Stations” layer and create the Relate. One for Surface and one for Groundwater tables containing the time series data.

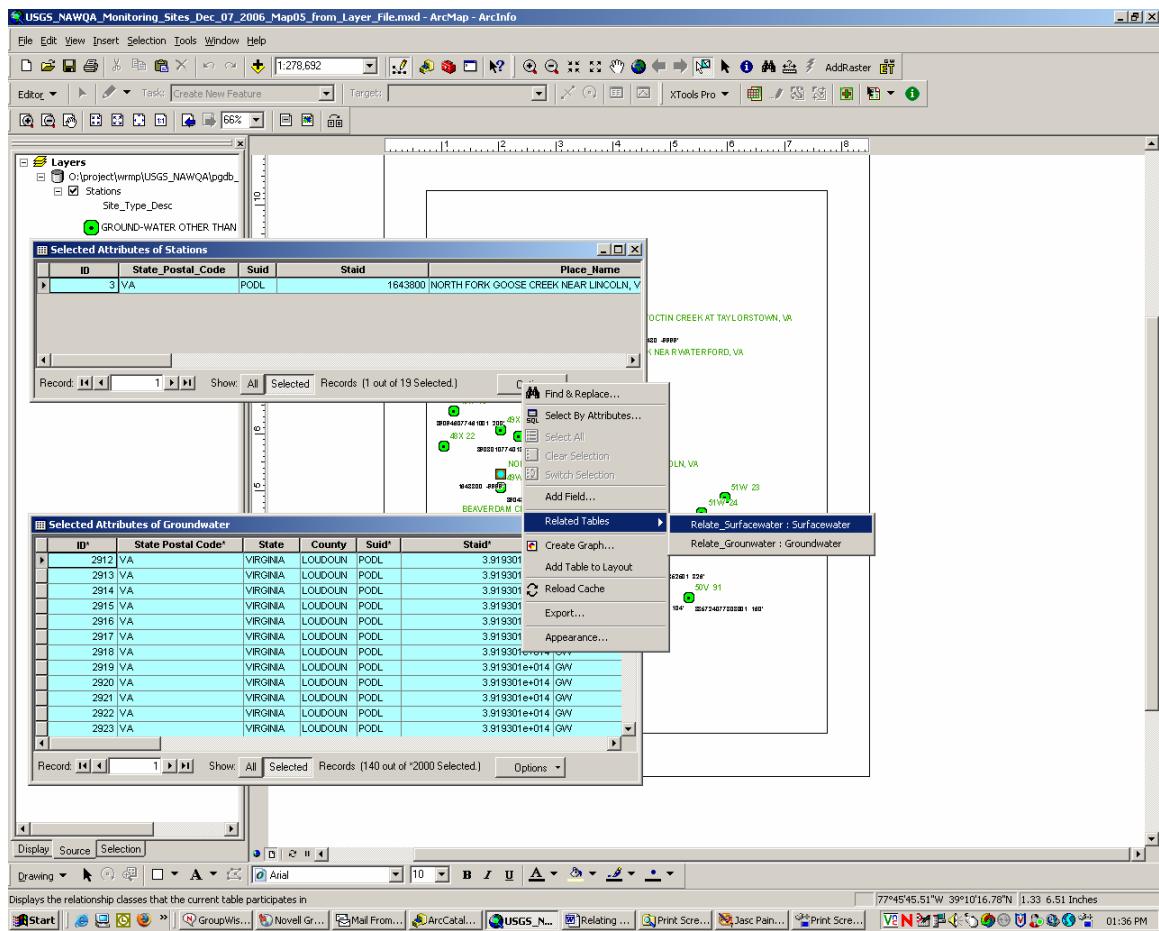


Sometimes this works, sometime the system simply crashes.

One can select one of the 19 stations and view the related 140 records with that one station, as shown below.



This is done by right clicking on Options on bottom right section of the table window.



You can't just open one of the related tables even though one of stations was selected. You'll find that none of the related records display

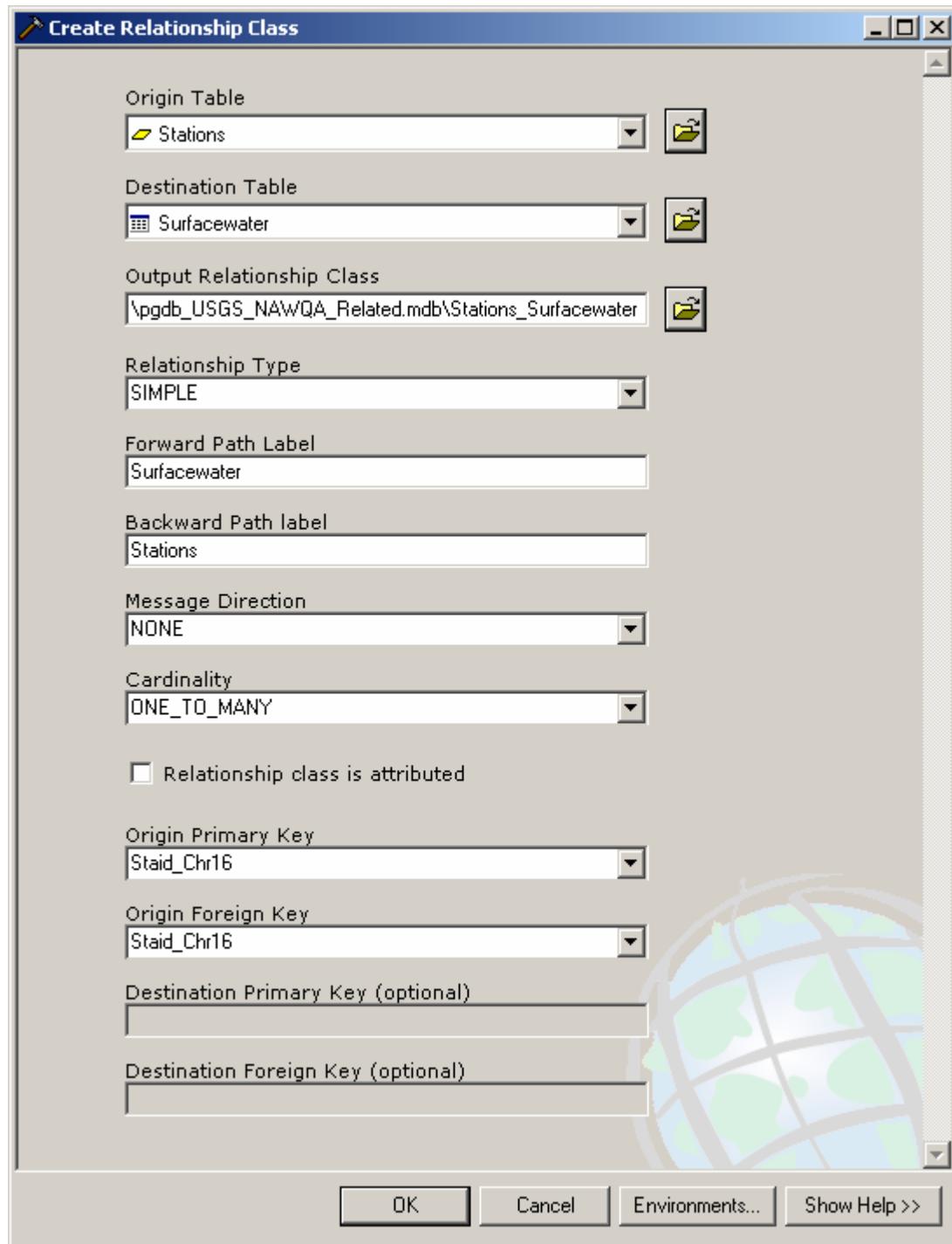
ID	State Postal Code*	State	County	Suid	Staid*	
1	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
2	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
3	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
4	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
5	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
6	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
7	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
8	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
9	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
10	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
11	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR
12	VA	VIRGINIA	LOUDOUN	PODL	1638450	RICHARD CR

The relationship is saved with the .lyr file.

However, you need to be very careful not to save the relationship both in the .lyr (i.e. from manually realte in ArcMAP with a relationship class in pgdb. This will likely cause system crash.

Step 2: Now examine storing the relationship class in pgdb.

In ArcToolBox > Data Management > Create Relationship Class



This crashes on local ArcGIS installation and Citrix.

Summary and Conclusion:

Manually create the relations in ArcMap and save the feature class as .lyr file. When going to use the data, just add the station point file. To view the related data, do not add to TOC, rather, open the stations table and in lower right under options, select related tables. Now when you select a record, in stations, just the related table records are selected also.

Creating Time Averaged Values

Background: Stream monitoring has been performed several times at locations and needs to be averaged. This memo describes one approach.

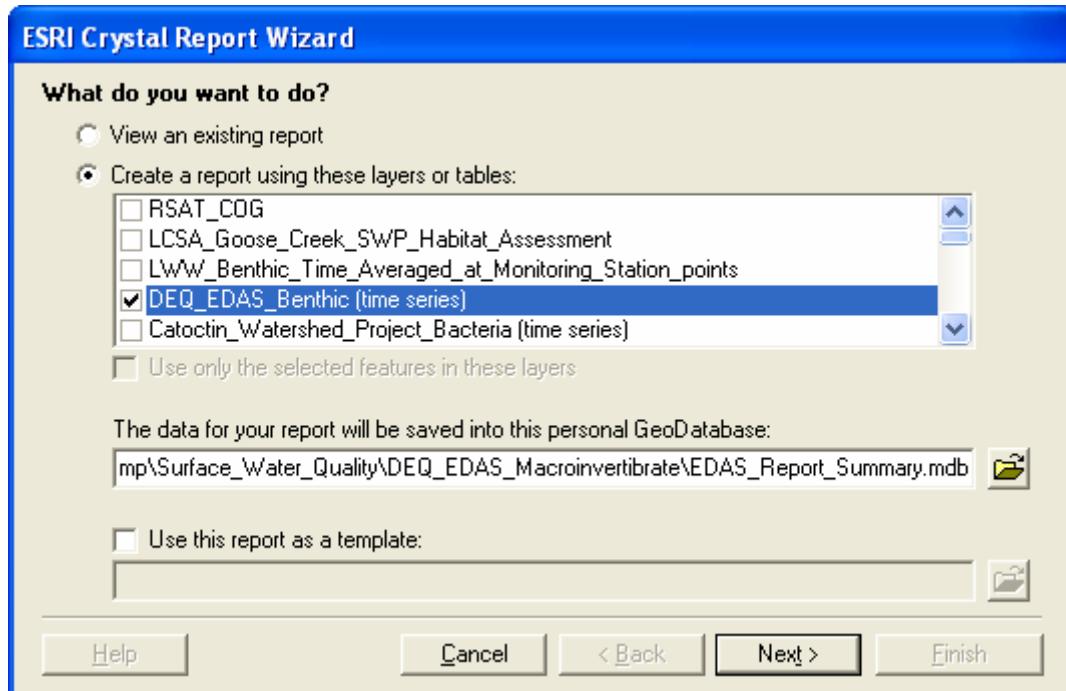
Approach:

A brute force approach is to create averages for each station by using ESRI report, summarizing using ‘sum’, cleaning-up the report export and then join this back to the stations point file.

Creating a report for “sum”:

First add both the station feature class and time series data table. Now join the stations to the points. This creates a new feature class with “stacked” measurements for the stations. So for the 19 stations we now have a feature class of 75 records. “DEQ_EDAS_TetraTech_IBI_SCI_joined_to_Stations”

Using the time series, run a report in ArcMap:



Crystal Report Wizard

Choose the information to display on the report.

Select fields whose data you want to report in the Available Fields list, then add them to the Fields to Display list. The order of the fields in the display list determines their position across the report.

Available Fields:

- IBI_SCI_Calculation_Scraper_Score
- IBI_SCI_Calculation_Chironomidae_Score
- IBI_SCI_Calculation_2Dom_Score
- IBI_SCI_Calculation_MFBI_Score
- IBI_SCI_Calculation_IBI_SCI
- _Stations_ID
- _Stations_StationIndex
- _Stations_StationID
- _Stations_StreamName

Fields to Display:

- DEQ_EDAS_Benthic_time_series_TetraT
- DEQ_EDAS_Benthic_time_series_TetraT
- DEQ_EDAS_Benthic_time_series_TetraT

Crystal Report Wizard

(Optional) Group the information on the report.

Grouping breaks the information into logical sections. It is only required if you want to summarize information for each section. Select a field and add it to the Group By list to create a section for each value of that field.

Available Fields:

- Benthic_time_series_TetraT
- IBI_SCI_Calculation_BenSamplD
- IBI_SCI_Calculation_StationID
- IBI_SCI_Calculation_CollDate
- IBI_SCI_Calculation_RepNum
- IBI_SCI_Calculation_TotTaxa
- IBI_SCI_Calculation_EPTTax
- IBI_SCI_Calculation_Ephem

Group By:

- Groups
 - DEQ_EDAS_Benthic_time_series_TetraT

Sort Order: in ascending order

Crystal Report Wizard

(Optional) Add summary information to the report.

For each group you can choose one or more fields to summarize. Add fields to the Summarized Fields list, then select the type of summary to calculate for each field.

For the Group:

Available Fields:

- BI_SCI_Calculation_Chironomidae_Score
- BI_SCI_Calculation_2Dom_Score
- BI_SCI_Calculation_MFBI_Score
- BI_SCI_Calculation_IBI_SCI
- Stations_ID
- Stations_StationIndex
- Stations_StationID
- Stations_StreamName
- Stations_Location

Summarized Fields:

Add Grand Totals

Crystal Report Wizard

(Optional) Sort the groups based on the summarized totals.

The groups on the report can be sorted by their summarized field (instead of by their group names). Select a group field to sort its groups. Select how to sort the groups. Then select a sort order (for Sort All), or the number of groups to show sorted (for topN or BottomN).

Sort the Groups of:

Based on

Order

Ascending

Descending

Crystal Report Wizard

(Optional) Select a subset of information to display on the report.

The data can be filtered so that only a subset displays on the report. Add a field to the Filtered Fields list, then select a filter to apply to it.

Available Fields:

Database
DEQ_EDAS_Benthic_time_
OBJECTID
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C
TetraTech_IBI_SCI_C

Filtered Fields:

[Help](#)

[Cancel](#)

[< Back](#)

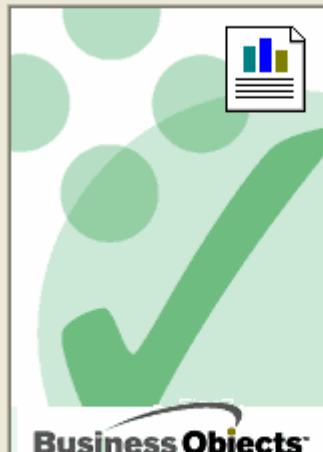
[Next >](#)

[Finish](#)

Crystal Report Wizard

Choose how to save the report, then view it.

D:\project\wrmp\Surface_Water_Quality\DEQ_EDAS_ [...](#)



How would you like to view the report?

- Preview (read only).
- Edit with Crystal Report Designer.
- View Later.

[Help](#)

[Cancel](#)

[< Back](#)

[Next >](#)

[Finish](#)

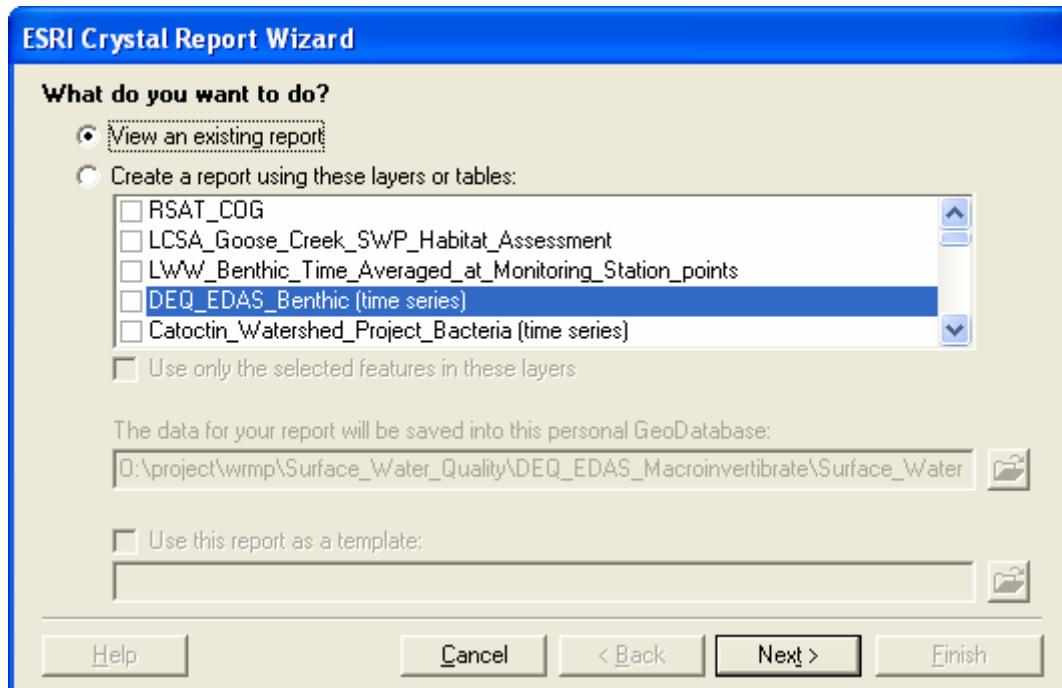
Preview

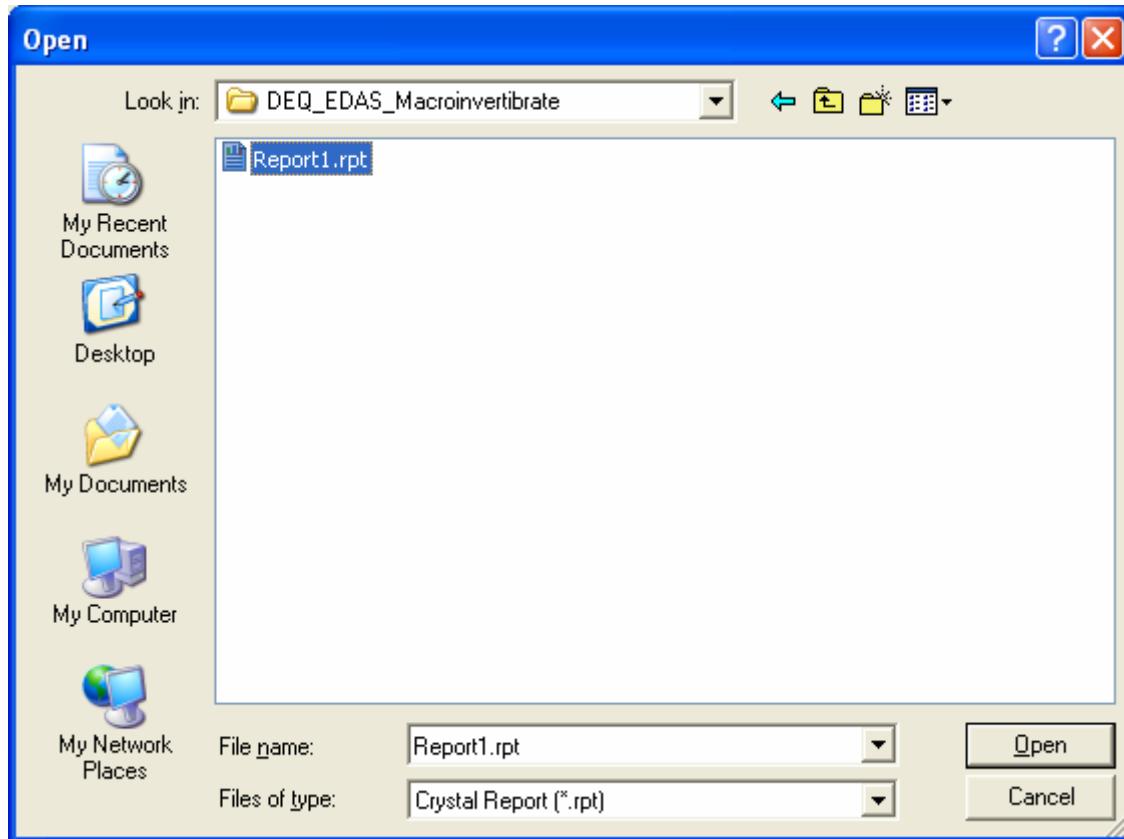
The screenshot shows a BusinessObjects preview window with the following data:

		07/20/2007	
TetraTech_IBI_SCI_Calculati	TetraTech_IBI_SCI_C	TetraTech_	
1ASOC011.98			
1ASOC011.98	06/27/2001 12:00:00	28.09	
1ASOC011.98	07/31/2003 12:00:00	31.01	
1ASOC011.98	07/31/2003 12:00:00		
1ASOC011.98		29.55	
1ABRB006.97			
1ABRB006.97	06/09/2005 12:00:00	36.13	
1ABRB006.97	09/08/2005 12:00:00	41.36	
1ABRB006.97		38.75	
1ABRB002.15			
1ABRB002.15	11/30/2004 12:00:00	32.36	
1ABRB002.15	06/06/2005 12:00:00	50.13	
1ABRB002.15	09/08/2005 12:00:00	53.79	
1ABRB002.15	06/08/2004 12:00:00	26.55	
1ABRB002.15		40.71	
1ABRB015.43			
1ABRB015.43	11/30/2005 12:00:00	43.93	
1ABRB015.43	06/09/2005 12:00:00	48.03	

Now “Export”.

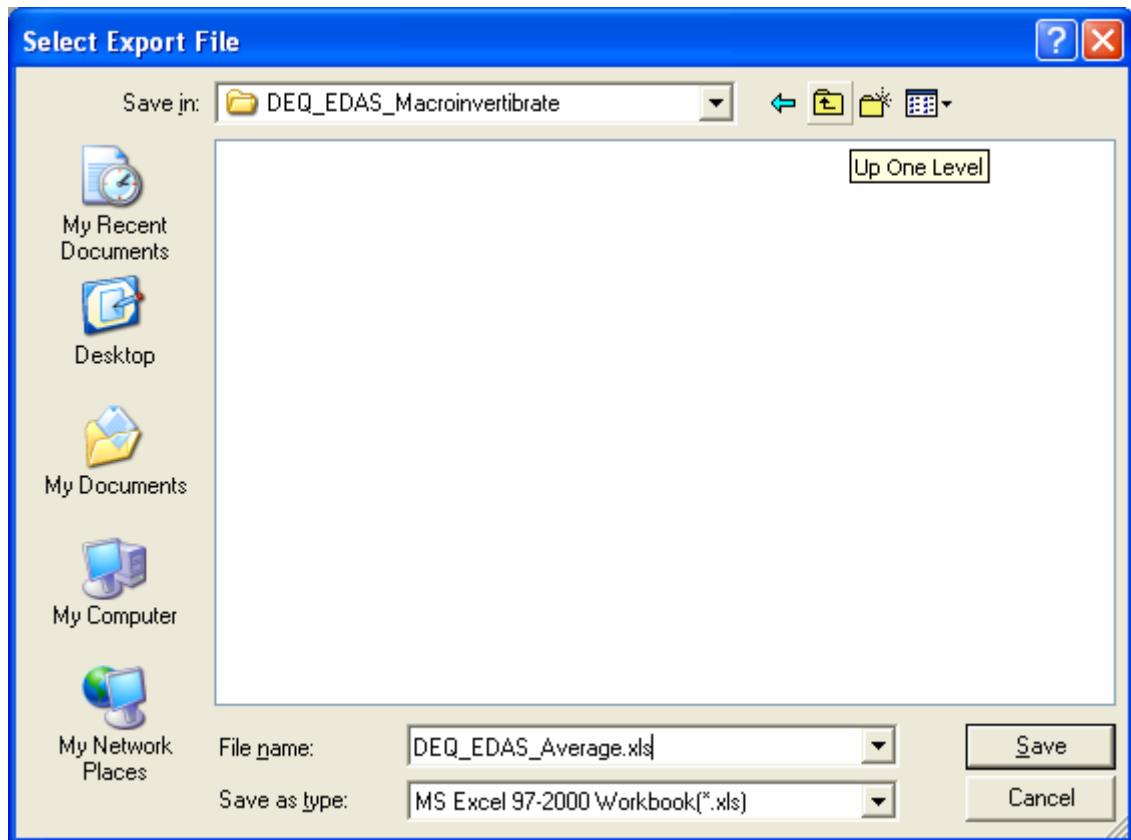
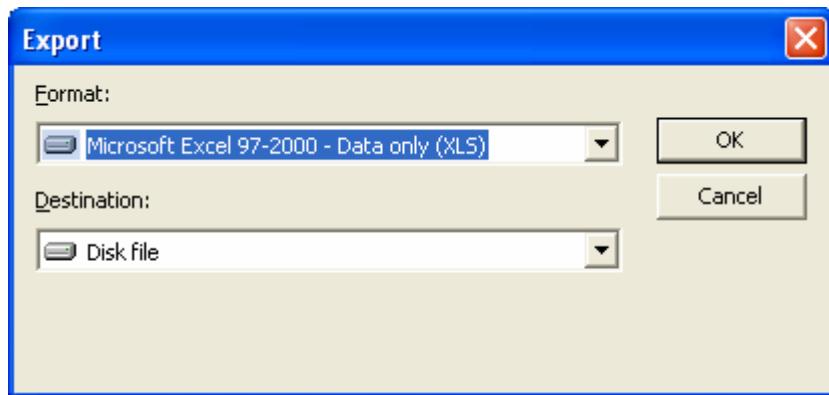
To do this go back and open existing report





Now there is a "Export" button available

A screenshot of a 'BusinessObjects' preview window. The title bar says 'Preview'. The left pane shows a tree view of report sections: 'Report1.rpt' expanded to show 'TetraTech_IBI_SCI_Calculation_StationID' which further expands to '1ASOC011.98', '1ABRB006.97', etc. The right pane displays a table of data. The table has three columns: 'TetraTech_IBI_SCI_Calculation_StationID' (e.g., 1ASOC011.98), 'TetraTech_IBI_SCI_Calculation_StartDate' (e.g., 06/27/2001), and 'TetraTech_IBI_SCI_Calculation_EndDate' (e.g., 07/31/2003). The table includes several section headers in bold: '1ASOC011.98', '1ABRB006.97', '1ABRB006.97', '1ABRB006.97', '1ABRB006.97', '1ABRB002.15', '1ABRB002.15', '1ABRB002.15', '1ABRB002.15', '1ABRB002.15', '1ABRB015.43', '1ABRB015.43', and '1ABRB015.43'. The total value for each section header is shown at the end of its respective group. The preview window has standard Windows-style controls (minimize, maximize, close) and a toolbar with various icons.



This is rather crude, but we can clean-up the file

Microsoft Excel - deq_edas_average.xls

A6 & 1ASOC011.98

	A	B	C	D	E
1	TetraTech_IBI_SCI_C	TetraTech_IBI_SCI_Calculati	TetraTech_IBI_SCI_Calculation_IBI_SCI		
2	1ASOC011.98				
3	1ASOC011.98	06/27/2001 12:00:00 AM	28.09		
4	1ASOC011.98	07/31/2003 12:00:00 AM	31.01		
5	1ASOC011.98	07/31/2003 12:00:00 AM			
6	1ASOC011.98	29.55			
7	1ABRB006.97				
8	1ABRB006.97	06/09/2005 12:00:00 AM	36.13		
9	1ABRB006.97	09/08/2005 12:00:00 AM	41.36		
10	1ABRB006.97		38.75		
11	1ABRB002.15				
12	1ABRB002.15	11/30/2004 12:00:00 AM	32.36		
13	1ABRB002.15	06/06/2005 12:00:00 AM	50.13		
14	1ABRB002.15	09/08/2005 12:00:00 AM	53.79		
15	1ABRB002.15	06/08/2004 12:00:00 AM	26.55		
16	1ABRB002.15		40.71		
17	1ABRB015.43				
18	1ABRB015.43	11/30/2005 12:00:00 AM	43.93		
19	1ABRB015.43	06/09/2005 12:00:00 AM	48.03		
20	1ABRB015.43		45.00		

Sheet1

Draw AutoShapes

Ready Sum=29.55013041

To be:

Microsoft Excel - deq_edas_average.xls

File Edit View Insert Format Tools Data Window Help

Adobe PDF

100% 8

C10 fx

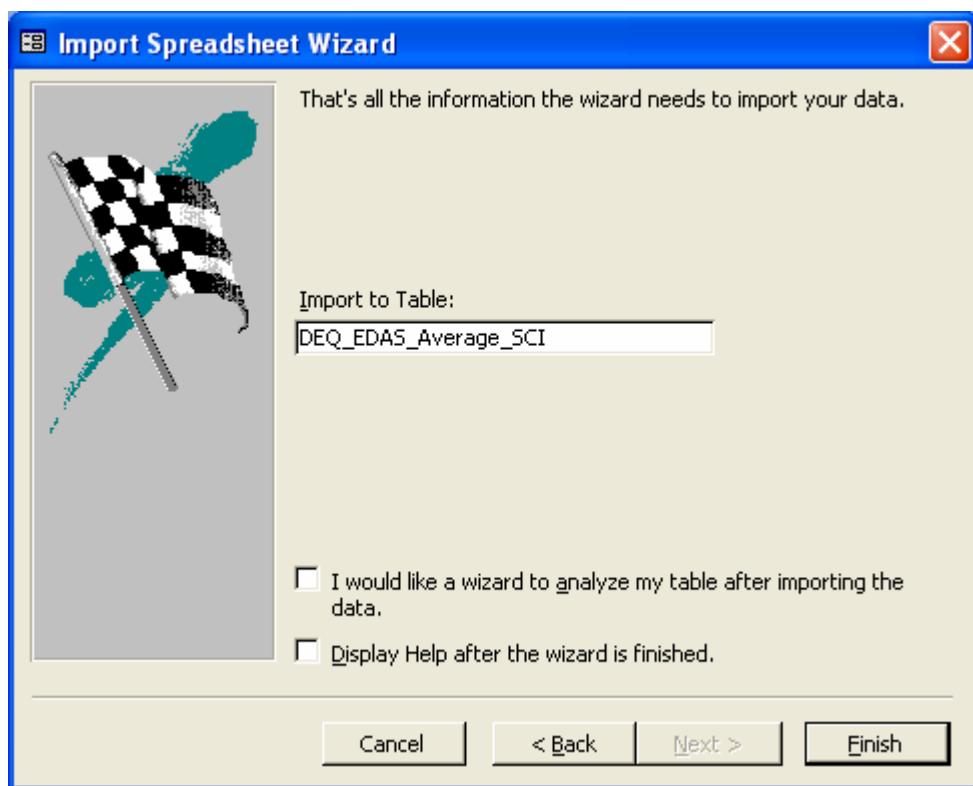
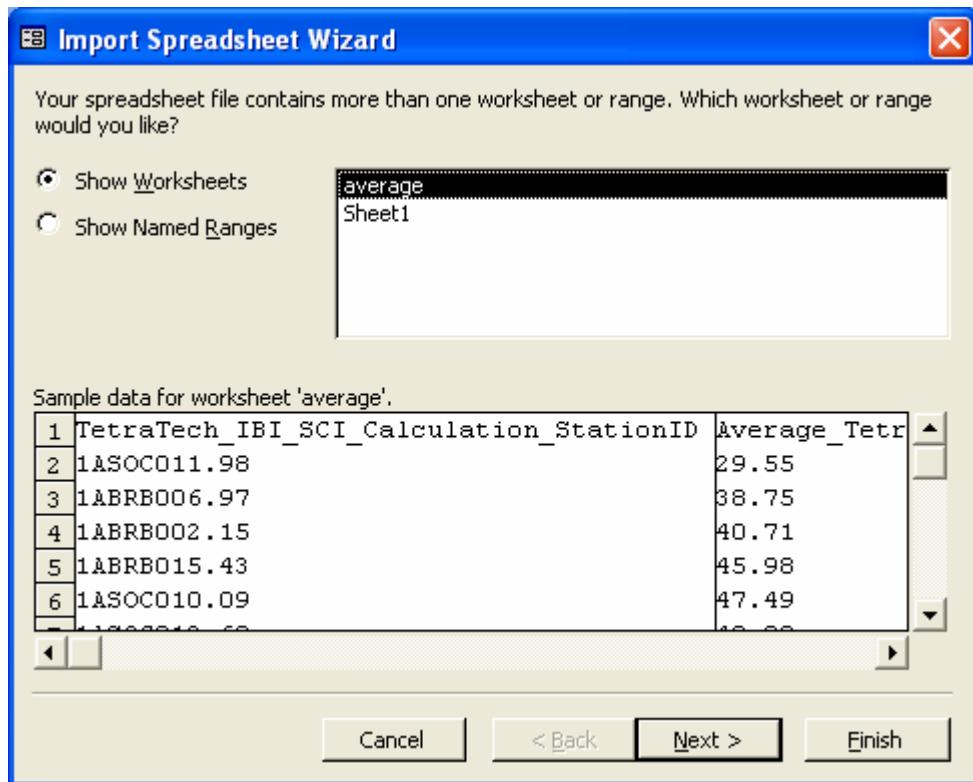
	A	B	C
1	TetraTech_IBI_SCI_Calculation	Average_TetraTech_IBI_SCI	
2	1ASOC011.98	29.55	
3	1ABRB006.97	38.75	
4	1ABRB002.15	40.71	
5	1ABRB015.43	45.98	
6	1ASOC010.09	47.49	
7	1ASOC012.60	48.00	
8	1ASOC007.06	48.68	
9	1ASOC000.01	55.33	
10	1ANOB007.97	56.59	
11	1ANOC000.42	57.78	
12	1ALIV004.78	61.82	
13	1AGO0003.18	66.54	
14	1ANOG000.91	67.33	
15	1AGO0022.44	67.72	
16	1AXGU000.18	67.83	
17	1AGO0036.47	68.53	
18	1ASOC013.05	69.29	
19	1ACAX004.57	69.63	
20	1ACRM009.86	70.44	
21	1AXKR000.77	74.68	
22			

\average / Sheet1 /

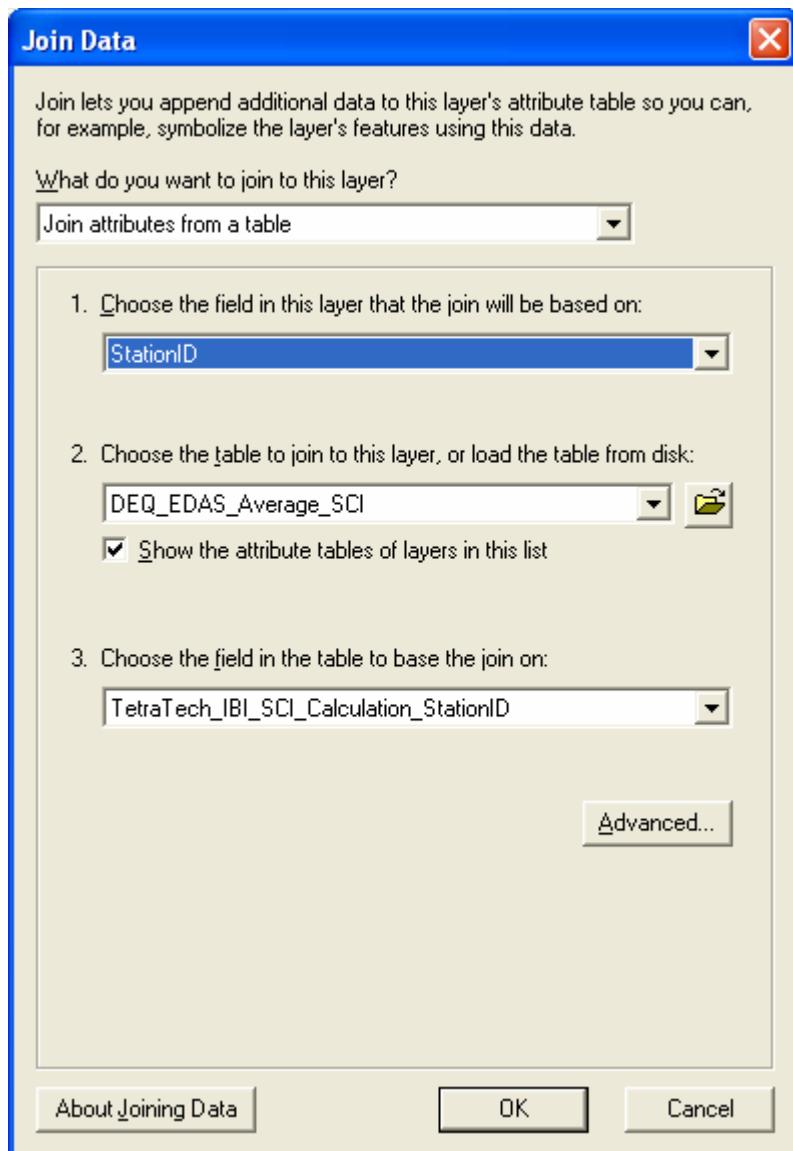
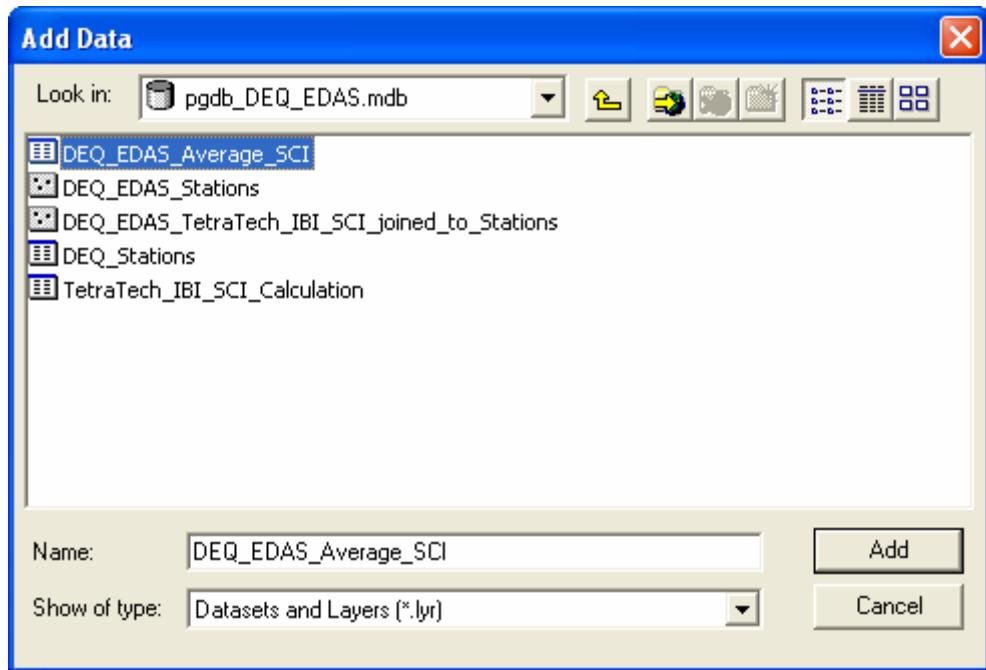
Draw AutoShapes

Ready

Now Import this back into pgdb, join stations to it and map it.



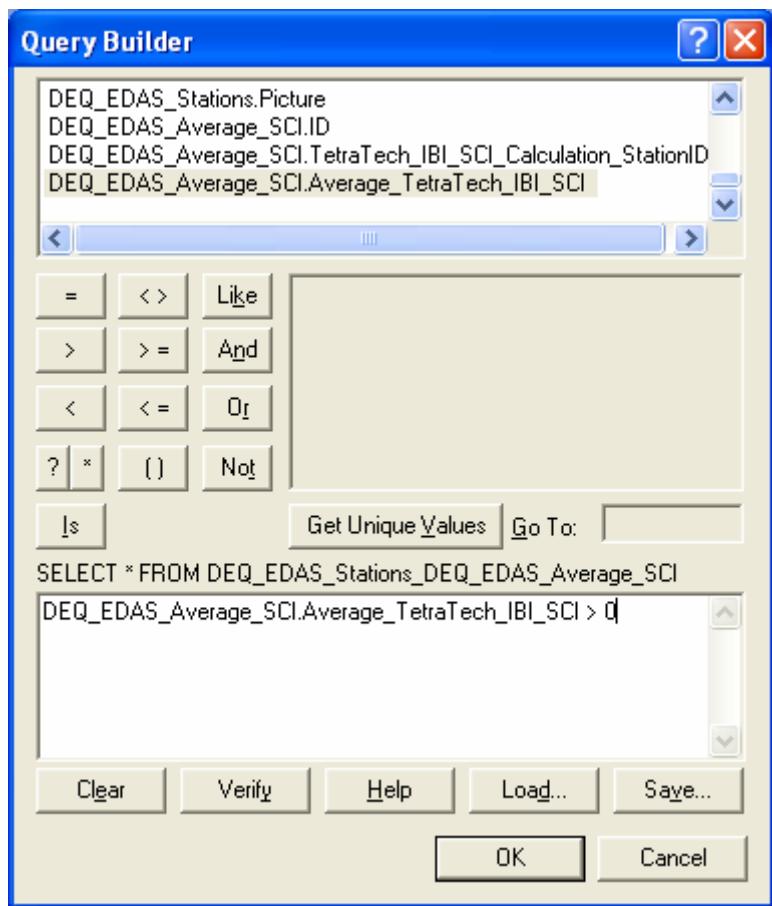
Now in ArcMap:



Now we see a good match on the 20 stations in Loudoun area

Shape	DEQ_ED	DEQ_EDAS_Avera	DEQ_EDAS_Average_SCI.Average_TetraTech_IBI_SCI
Point	20	1AXKR000.77	74.679537
Point	19	1ACRM009.86	70.440550
Point	18	1ACAX004.57	69.628831
Point	17	1ASOC013.05	69.291290
Point	16	1AG000036.47	68.533022
Point	15	1AXGU000.18	67.829553
Point	14	1AG00022.44	67.717940
Point	13	1ANOG000.91	67.333851
Point	12	1AG00003.18	66.541538
Point	11	1ALIV004.78	61.816464
Point	10	1ANOC000.42	57.777186
Point	9	1ANOB007.97	56.594295
Point	8	1ASOC000.01	55.326898
Point	7	1ASOC007.06	48.682738
Point	6	1ASOC012.60	47.998137
Point	5	1ASOC010.09	47.489035
Point	4	1ABRB015.43	45.980097
Point	3	1ABRB002.15	40.710341
Point	2	1ABRB006.97	38.746455
Point	1	1ASOC011.98	29.550130
Point	<Null>	<Null>	<Null>
Point	<Null>	<Null>	<Null>

Lets' trim these 1,112 down to the 20 using Definition Query



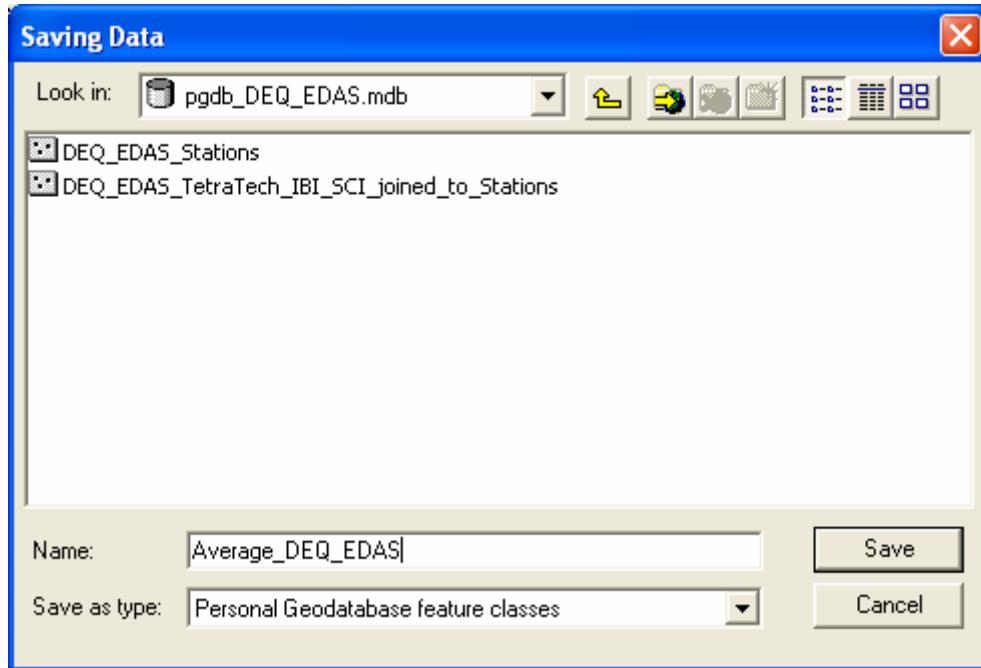
Attributes of DEQ_EDAS_Stations

DEQ_EDAS_Aver	DEQ_EDAS_Average_SCI.Average_TetraTech_IBI_SCI
1ABRB002.15	40.710341
1ABRB006.97	38.746455
1ABRB015.43	45.980097
1ACAX004.57	69.628831
1ACRM009.86	70.440550
1AG00003.18	66.541538
1AG00022.44	67.717940
1AG00036.47	68.533022
1ALIV004.78	61.816464
1ANOB007.97	56.594295
1ANOC000.42	57.777186
1ANOG000.91	67.333851
1ASOC000.01	55.326898
1ASOC007.06	48.682738
1ASOC010.09	47.489035
1ASOC011.98	29.550130
1ASOC012.60	47.998137
1ASOC013.05	69.291290
1AXGU000.18	67.829553
1AXKR000.77	74.679537

Record: 1 Show: All Selected Records (0 out of 20 Selected.)

This screenshot shows the 'Attributes of DEQ_EDAS_Stations' dialog box. It displays a table with two columns: 'DEQ_EDAS_Aver' and 'DEQ_EDAS_Average_SCI.Average_TetraTech_IBI_SCI'. The table lists 20 rows of data. At the bottom, there are navigation buttons for records (Back, Forward) and a 'Show' dropdown set to 'All'. A status bar at the bottom indicates 'Records (0 out of 20 Selected.)'.

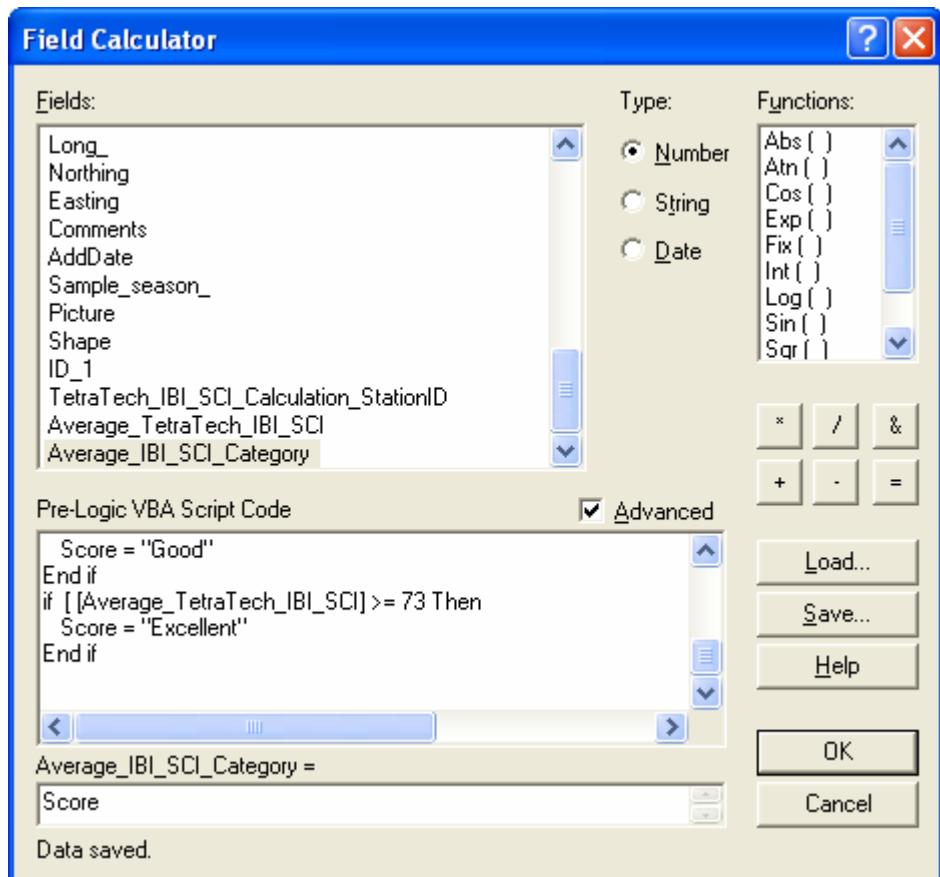
Now we need to add classification, but first save the joined table as a new feature class



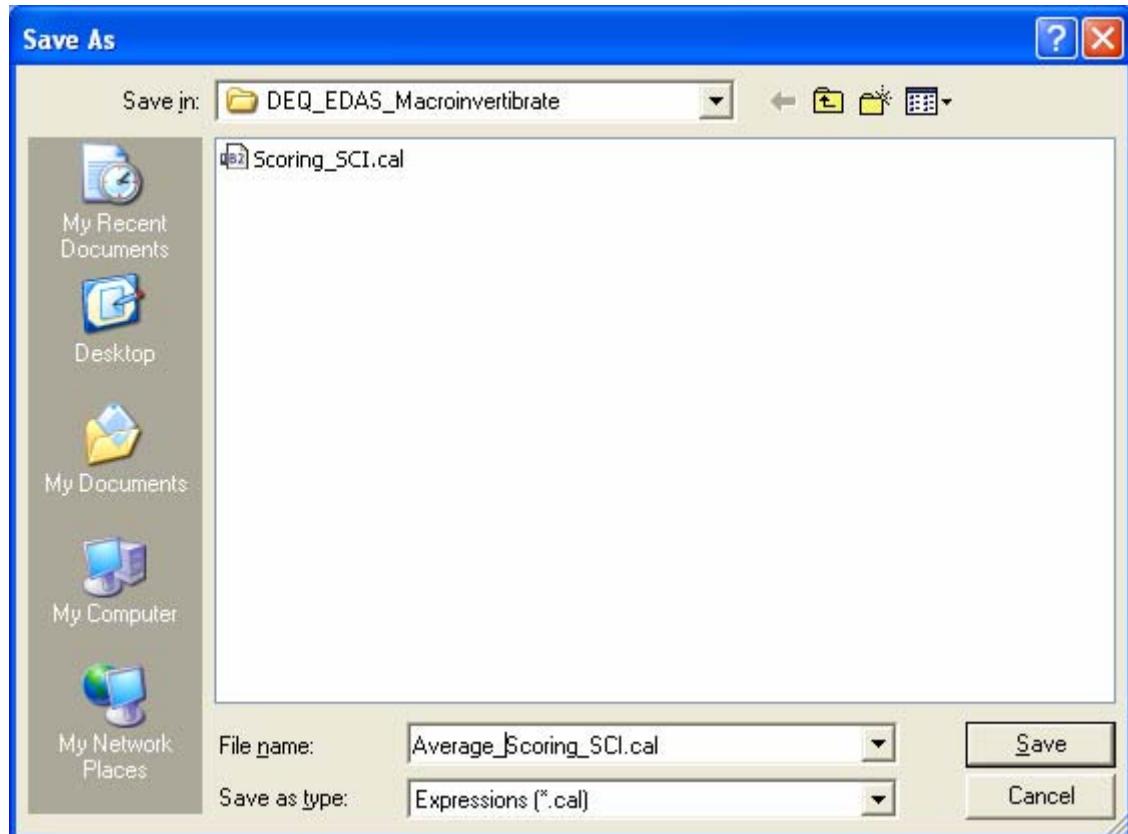
Now add a field for the text classification (string 25)

In Field Calculator

```
Dim Score as string
if [Average_TetraTech_IBI_SCI] < 42 Then
    Score = "Severe Stress"
End if
if [Average_TetraTech_IBI_SCI] >= 42 and
[Average_TetraTech_IBI_SCI] < 55 Then
    Score = "Moderate Stress"
End if
if [Average_TetraTech_IBI_SCI] >= 55 and
[Average_TetraTech_IBI_SCI] < 63 Then
    Score = "Unknown or Fair"
End if
if [Average_TetraTech_IBI_SCI] >= 63 and
[Average_TetraTech_IBI_SCI] < 73 Then
    Score = "Good"
End if
if [Average_TetraTech_IBI_SCI] >= 73 Then
    Score = "Excellent"
End if
```



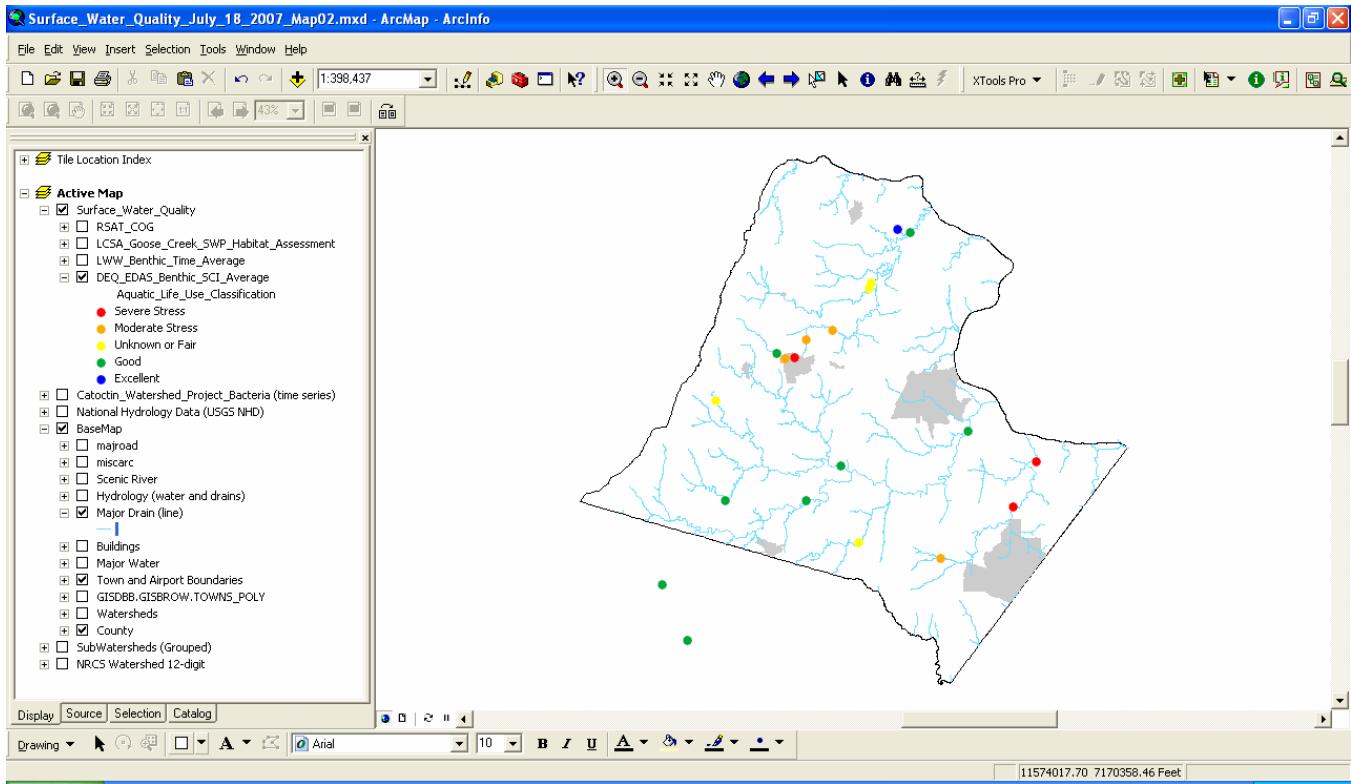
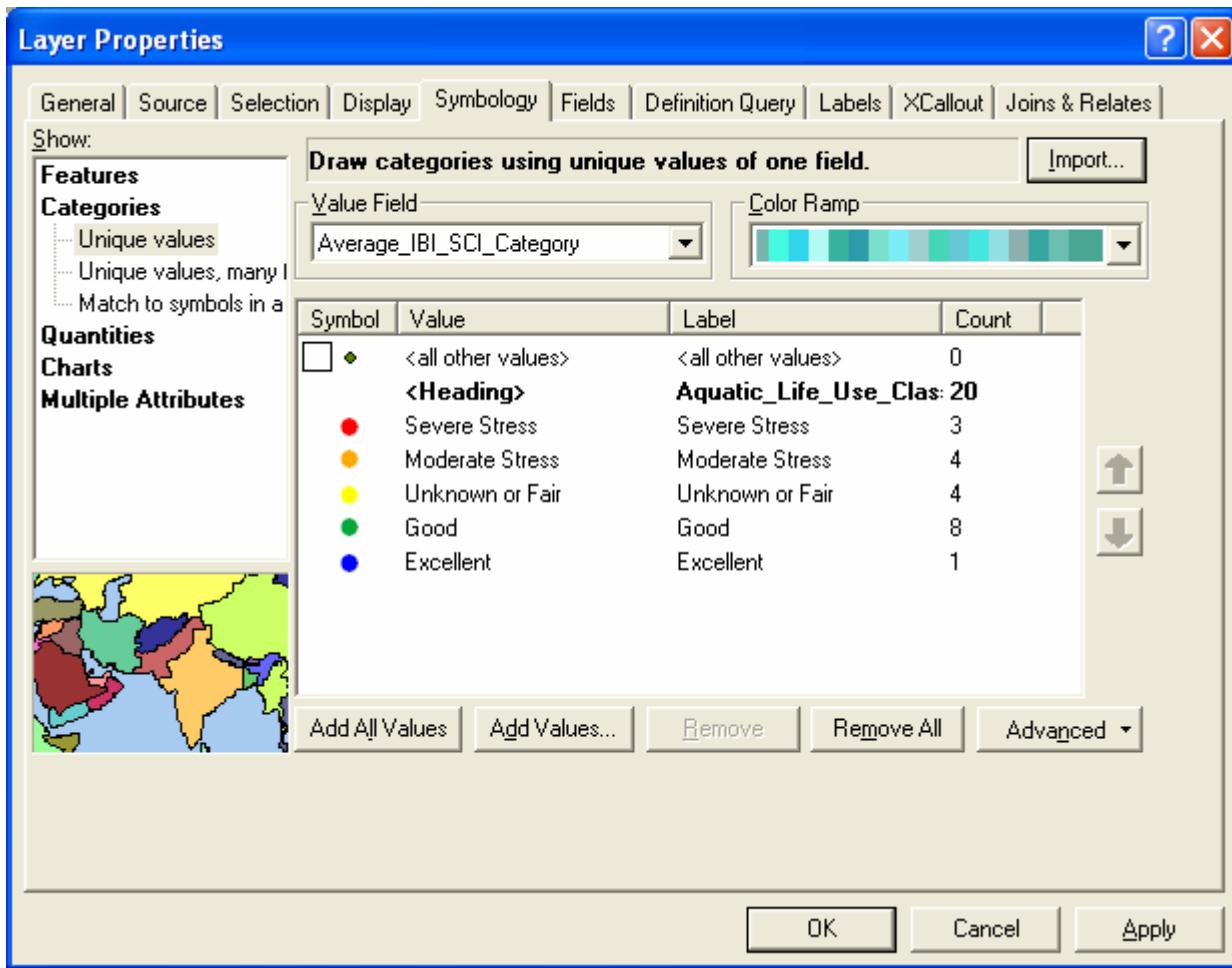
And save the calculation



So we now have:

Attributes of Average_DEQ_EDAS			
ID_1	TetraTech_IBI_SCI	Average_TetraTech_IBI_SCI	Average_IBI_SCI_Category
3	1ABRB002.15	40.710341	Severe Stress
2	1ABRB006.97	38.746455	Severe Stress
4	1ABRB015.43	45.980097	Moderate Stress
18	1ACAX004.57	69.628831	Good
19	1ACRM009.86	70.440550	Good
12	1AG00003.18	66.541538	Good
14	1AG00022.44	67.717940	Good
16	1AG00036.47	68.533022	Good
11	1ALIV004.78	61.816464	Unknown or Fair
9	1ANOB007.97	56.594295	Unknown or Fair
10	1ANOC000.42	57.777186	Unknown or Fair
13	1ANOG000.91	67.333851	Good
8	1ASOC000.01	55.326898	Unknown or Fair
7	1ASOC007.06	48.682738	Moderate Stress
5	1ASOC010.09	47.489035	Moderate Stress
1	1ASOC011.98	29.550130	Severe Stress
6	1ASOC012.60	47.998137	Moderate Stress
17	1ASOC013.05	69.291290	Good
15	1AXGU000.18	67.829553	Good
20	1AXKR000.77	74.679537	Excellent

and can map this



R

