CANADA • ALBERTA • SASKATCHEWAN • MANITOBA

PRAIRIE PROVINCES WATER BOARD

Report #179

Appendices A to D

Long-Term Trends in Water Quality Parameters
At Twelve Transboundary River Reaches
(From the beginning of the data record until the end of 2013)

Prepared for the Prairie Provinces Water Board
By the Committee on Water Quality

March 2018

Appendix A: Basic Statistics of Trended Water Quality Parameter

Table A1: Battle River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	392	0.13	0.204	1.47	0.414	0.0325	0.016	0
Nitrate as N	565	0.129	0.234	2.6	0.45	0.01	0.005	0.0005
Nitrogen Total	234	1.317	0.84	6.38	2.057	1.117	0.665	0.45
Phosphorous Total	480	0.112	0.136	0.973	0.263	0.0625	0.0265	0.01
Phosphorous Total Dissolved	453	0.0289	0.0265	0.245	0.0532	0.021	0.011	0.003
Major Ions (mg/L)								
Chloride Dissolved	567	23.422	13.283	175	38.46	21.6	9.2	0.4
Fluoride Dissolved	513	0.235	0.0693	0.79	0.302	0.23	0.16	0.025
Sodium Dissolved/Filtered	567	122.935	45.511	336	180	124	65	4.5
Sulphate Dissolved	566	141.155	48.437	389	200	142	80.6	14
Total Dissolved Solids	388	623.004	212.832	1728.714	864.134	612.887	357.2	218.366
Physicals (Units)								
Oxygen Dissolved (mg/L)	473	7.831	3.912	18.7	12.5	8.6	1.2	0.01
pH – Field (pH units)	474	8.184	0.463	9.23	8.701	8.3	7.5	6.95
Sodium Adsorption Ratio (units)	458	3.345	0.983	7.509	4.679	3.258	2.142	0.64
Total Suspended Solids (mg/L)	497	71.463	163.957	1146	174.6	13.6	2.8	0.5
Metals (µg/L)								
Aluminum Dissolved	128	10.45	33.35	323	13.72	3.85	1	0.3
Aluminum Total	128	775.048	2256.989	19300	1615	85.5	30.65	12.7
Arsenic Dissolved	128	1.825	1.12	8	3.462	1.52	0.756	0.49
Arsenic Total	128	2.975	1.922	10.1	5.15	2.47	1.09	0.64
Barium Dissolved	128	98.288	32.763	197	144.7	98.35	60.06	33.2
Barium Total	128	135.102	73.857	720	181.5	124	82.15	35.6
Beryllium Dissolved	128	0.00673	0.00887	0.059	0.0157	0.004	0.001	0.0005
Beryllium Total	128	0.0823	0.213	1.46	0.175	0.016	0.005	0.0005
Boron Dissolved	128	202.587	76.564	421	281.8	208.5	96.17	15
Boron Total	128	214.137	76.906	417	306.4	221	105.8	23.7
Cadmium Dissolved	128	0.0351	0.0489	0.37	0.0657	0.019	0.007	0.001
Cadmium Total	128	0.0522	0.107	0.952	0.108	0.021	0.0103	0.004
Chromium Dissolved	128	0.0765	0.0907	0.64	0.148	0.05	0.027	0.009
Chromium Total	128	1.128	3.21	29.2	2.228	0.207	0.097	0.0025
Cobalt Dissolved	128	0.383	0.435	2.77	0.524	0.257	0.197	0.159
Cobalt Total	128	1.348	2.512	20.3	2.909	0.452	0.269	0.196
Copper Dissolved	128	1.529	0.762	4.14	2.601	1.41	0.707	0.13
Copper Total	128	3.676	6.017	49.3	6.973	1.935	0.913	0.27
Iron Dissolved	128	146.604	523.324	4770	136.4	33.9	19.5	8.7
Iron Total	128	2099.43	4904.956	41700	4590	557.5	234.5	120
Lead Dissolved	128	0.0518	0.0751	0.66	0.0914	0.033	0.013	0.0025
Lead Total	128	1.35	3.527	27.3	3.069	0.224	0.0953	0.056
Lithium Dissolved	128	71.566	23.731	132	100.89	75.3	40.06	4.97
Lithium Total	128	76.861	23.054	143	104.1	79.65	44.98	27.1
Manganese Dissolved	128	95.168	242.153	1550	231	15.9	2.909	1.18
Manganese Total	128	216.123	324.329	2080	519.8	104.5	20.53	6.56
Molybdenum Dissolved	128	1.612	0.335	2.58	2.11	1.565	1.253	0.637
Molybdenum Total	128	1.599	0.396	2.57	2.144	1.59	1.15	0.417
Nickel Dissolved	128	3.825	1.013	7.06	5.114	3.715	2.66	0.87
Nickel Total	128	6.404	7.101	61	11.11	4.39	2.97	1.77
Selenium Dissolved	128	0.173	0.108	0.78	0.23	0.16	0.09	0.025
Selenium Total	128	0.213	0.16	1.24	0.307	0.185	0.09	0.025
Silver Dissolved	128	0.00263	0.00228	0.014	0.0057	0.002	0.0005	0.0005

Silver Total	128	0.0151	0.0374	0.319	0.029	0.004	0.0013	0.0005
Thallium Dissolved	128	0.00935	0.00643	0.04	0.0167	0.008	0.0033	0.0005
Thallium Total	128	0.0262	0.045	0.349	0.0479	0.012	0.0053	0.0005
Uranium Dissolved	128	1.243	0.35	2.44	1.652	1.245	0.836	0.508
Uranium Total	128	1.421	0.449	3.04	2.03	1.37	0.92	0.527
Vanadium Dissolved	128	0.808	0.519	2.46	1.604	0.687	0.249	0.107
Vanadium Total	128	3.189	5.88	45	6.054	1.43	0.4	0.2
Zinc Dissolved	128	1.108	0.847	5.7	2.073	0.915	0.3	0.025
Zinc Total	128	7.721	19.554	162	16.57	1.605	0.858	0.025

Table A2: Beaver River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	352	0.196	0.323	2.78	0.619	0.05	0.012	0
Nitrate as N	474	0.119	0.14	0.972	0.29	0.06	0.005	0.0005
Nitrogen Total	211	1.018	0.448	3.48	1.492	0.94	0.606	0.27
Phosphorous Total	444	0.0956	0.0834	0.72	0.159	0.071	0.0429	0.025
Phosphorous Total Dissolved	416	0.038	0.0397	0.54	0.059	0.0285	0.016	0.009
Major Ions (mg/L)								
Chloride Dissolved	446	4.346	3.146	34.9	7.693	3.7	1.523	0.05
Fluoride Dissolved	432	0.137	0.047	0.55	0.19	0.13	0.09	0.01
Sodium Dissolved/Filtered	447	19.109	11.663	95.3	33.28	17	7.796	1.6
Sulphate Dissolved	447	14.824	10.826	131	25.28	13	5.744	1.65
Total Dissolved Solids	312	237.354	95.296	687.884	368.3	227.132	133.987	83
Physicals (Units)								
Oxygen Dissolved (mg/L)	428	7.413	4.036	14.6	12	8.47	0.8	0.01
pH – Field (pH units)	429	7.858	0.446	8.9	8.4	7.9	7.3	5.9
Sodium Adsorption Ratio (units)	393	0.595	0.28	2.583	0.913	0.556	0.311	0.18
Total Suspended Solids (mg/L)	447	17.023	27.742	273	37.96	6.6	2.6	0.5
Metals (µg/L)								
Aluminum Dissolved	120	5.464	5.388	34.6	9.8	3.8	1.75	1
Aluminum Total	120	144.883	232.041	1880	283.5	62.35	19.45	1.4
Arsenic Dissolved	120	0.818	0.304	2.58	1.09	0.725	0.59	0.37
Arsenic Total	120	1.154	0.411	2.93	1.615	1.045	0.81	0.53
Barium Dissolved	120	52.062	19.904	151	71.7	46.3	35.15	26.2
Barium Total	120	60.156	20.192	163	80.5	54.6	44.05	34.8
Beryllium Dissolved	120	0.00433	0.00241	0.018	0.007	0.004	0.002	0.0005
Beryllium Total	120	0.0141	0.0164	0.139	0.024	0.01	0.005	0.0005
Boron Dissolved	120	40.663	16.473	113	58.5	36.05	24.25	13.8
Boron Total	120	42.713	17.471	126	62.15	38.1	26.35	14
Cadmium Dissolved	120	0.044	0.136	1.4	0.0835	0.017	0.004	0.0005
Cadmium Total	120	0.0261	0.0469	0.407	0.0575	0.011	0.005	0.0005
Chromium Dissolved	120	0.0609	0.0266	0.192	0.083	0.054	0.039	0.029
Chromium Total	120	0.343	0.449	3.8	0.555	0.205	0.11	0.054
Cobalt Dissolved	120	0.155	0.228	1.51	0.287	0.0825	0.058	0.043
Cobalt Total	120	0.302	0.326	2.28	0.508	0.205	0.117	0.05
Copper Dissolved	120	0.458	0.206	1.76	0.67	0.42	0.275	0.074
Copper Total	120	0.759	0.543	4.34	1.19	0.59	0.37	0.25
Iron Dissolved	120	253.257	411.64	3610	429.5	174.5	52.55	24.6
Iron Total	120	920.441	848.128	6940	1260	708	391	56.9
Lead Dissolved	120	0.0357	0.0288	0.164	0.0695	0.0285	0.011	0.0025
Lead Total	120	0.218	0.294	2.47	0.389	0.144	0.053	0.015
Lithium Dissolved	120	11.643	5.152	31.8	18.25	10.025	6.425	4.5
Lithium Total	120	12.398	5.287	34.4	19.45	10.85	7.045	5.5
Manganese Dissolved	120	182.105	491.567	3300	493	22.5	3.79	1.37
Manganese Total	120	231.641	511.413	3580	525	89.85	30.2	13.3
Molybdenum Dissolved	120	0.623	0.399	3.44	0.973	0.519	0.337	0.209
Molybdenum Total	120	0.647	0.429	3.68	1.003	0.556	0.347	0.202
Nickel Dissolved	120	0.698	0.189	1.43	0.975	0.66	0.49	0.33
Nickel Total	120	0.991	0.672	5.97	1.38	0.78	0.595	0.35
Selenium Dissolved	120	0.0615	0.0345	0.22	0.09	0.06	0.025	0.025
Selenium Total	120	0.0762	0.0461	0.3	0.115	0.07	0.0275	0.02

Silver Total	120	0.0052	0.00624	0.036	0.015	0.003	0.00075	0.0005
Thallium Dissolved	120	0.00258	0.00249	0.017	0.005	0.002	0.001	0.0005
Thallium Total	120	0.0055	0.00542	0.038	0.01	0.004	0.002	0.0005
Uranium Dissolved	120	0.221	0.0849	0.568	0.33	0.213	0.129	0.0432
Uranium Total	120	0.241	0.0895	0.603	0.353	0.23	0.143	0.0625
Vanadium Dissolved	120	0.28	0.124	0.578	0.451	0.273	0.127	0.088
Vanadium Total	120	0.752	0.782	6.46	1.275	0.528	0.234	0.123
Zinc Dissolved	120	1.148	0.977	7.5	2.105	0.9	0.4	0.025
Zinc Total	120	2.041	2.34	18.4	3.16	1.405	0.635	0.025

Table A3: Cold River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	87	0.0106	0.00908	0.078	0.0158	0.009	0.0025	0
Nitrate as N	87	0.0265	0.0276	0.099	0.069	0.005	0.005	0.005
Nitrogen Total	84	0.428	0.0673	0.956	0.474	0.417	0.385	0.33
Phosphorous Total	87	0.0186	0.0135	0.134	0.023	0.018	0.011	0.006
Phosphorous Total Dissolved	87	0.00955	0.00547	0.038	0.016	0.009	0.004	0.001
Major Ions (mg/L)								
Chloride Dissolved	111	0.768	0.287	2.7	0.984	0.73	0.556	0.23
Fluoride Dissolved	112	0.102	0.0226	0.18	0.12	0.1	0.08	0.01
Sodium Dissolved/Filtered	112	9.101	0.72	13	9.72	9.075	8.645	4.7
Sulphate Dissolved	111	3.318	0.763	5.1	4.6	3.02	2.676	1.35
Total Dissolved Solids	104	149.319	12.807	240.814	160.006	148.097	140.9	85.8
Physicals (Units)								
Oxygen Dissolved (mg/L)	109	11.421	1.576	14.96	13.23	11.64	9.46	7
pH – Field (pH units)	107	8.319	0.332	9.16	8.726	8.32	7.9	7.4
Sodium Adsorption Ratio (units)	112	0.351	0.0189	0.436	0.365	0.35	0.337	0.27
Total Suspended Solids (mg/L)	87	1.515	1.41	7.8	3.24	1.2	0.5	0.5
Metals (µg/L)								
Aluminum Dissolved	57	1.047	0.813	4.9	1.86	0.9	0.1	0.1
Aluminum Total	57	2.788	5.904	44.7	5.06	1.6	0.5	0.1
Arsenic Dissolved	57	0.872	0.085	1.16	0.948	0.87	0.776	0.68
Arsenic Total	57	0.973	0.255	2.74	1.058	0.93	0.85	0.76
Barium Dissolved	57	35.035	1.899	39.6	37.58	34.8	32.6	31
Barium Total	57	36.889	2.83	41.9	39.74	36.9	34.9	20.7
Boron Dissolved	57	25.768	2.197	31.3	29.1	25.2	23.34	20.9
Boron Total	57	27.189	1.803	32.4	29.28	27.1	25.22	23.4
Cadmium Dissolved	57	0.0516	0.145	1.02	0.103	0.015	0.0012	0.0005
Cadmium Total	57	0.022	0.0828	0.621	0.0298	0.005	0.001	0.0005
Chromium Dissolved	57	0.0233	0.0252	0.15	0.04	0.018	0.008	0.0025
Chromium Total	57	0.0482	0.152	1.14	0.0744	0.02	0.0062	0.0025
Cobalt Dissolved	57	0.0108	0.00344	0.025	0.014	0.011	0.0072	0.001
Cobalt Total	57	0.012	0.0029	0.022	0.0158	0.012	0.009	0.005
Copper Dissolved	57	0.211	0.319	2.44	0.396	0.14	0.072	0.01
Copper Total	57	0.179	0.141	0.91	0.356	0.14	0.074	0.01
Iron Dissolved	57	1.648	1.207	6.9	2.6	1.4	0.25	0.25
Iron Total	57	6.267	4.329	24.9	10.36	5.1	2.7	0.25
Lithium Dissolved	57	8.111	0.628	10.3	8.95	8.04	7.41	7.12
Lithium Total	56	8.492	0.68	10.7	9.236	8.5	7.821	6.1
Manganese Dissolved	56	0.633	0.725	5.24	1.121	0.515	0.174	0.05
Manganese Total	56	1.23	0.637	3.16	1.973	1.065	0.646	0.13
Molybdenum Dissolved	57	0.452	0.0428	0.62	0.5	0.445	0.408	0.389
Molybdenum Total	57	0.473	0.0435	0.662	0.512	0.469	0.432	0.337
Nickel Dissolved	57	0.149	0.0567	0.29	0.21	0.15	0.072	0.01
Nickel Total	57	0.126	0.0365	0.23	0.16	0.13	0.09	0.01
Uranium Dissolved	57	0.0818	0.00758	0.101	0.0887	0.0825	0.0766	0.0393
Uranium Total	57	0.0843	0.0117	0.104	0.0908	0.0852	0.0802	0.0042
Vanadium Dissolved	57	0.114	0.0172	0.192	0.131	0.112	0.098	0.09
Vanadium Total	57	0.125	0.0211	0.2	0.151	0.119	0.105	0.08
Zinc Dissolved	57	0.521	0.358	1.62	1	0.4	0.164	0.025

Table A4: North Saskatchewan River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	308	0.116	0.159	0.825	0.355	0.024	0.0063	0
Nitrate as N	308	0.318	0.222	0.945	0.621	0.317	0.005	0.005
Nitrogen Total	234	0.797	0.598	4.602	1.21	0.679	0.268	0.16
Phosphorous Total	307	0.103	0.195	1.72	0.211	0.05	0.015	0.006
Phosphorous Total Dissolved	295	0.0295	0.0315	0.215	0.075	0.017	0.005	0.001
Major Ions (mg/L)								
Chloride Dissolved	251	4.274	2.615	25.4	6.368	3.8	2.106	1.13
Fluoride Dissolved	250	0.145	0.0278	0.24	0.18	0.15	0.11	0.01
Sodium Dissolved/Filtered	250	8.888	3.578	34.5	12.35	8.305	5.82	1.35
Sulphate Dissolved	251	46.168	9.997	75	55.6	47.7	33.8	2.4
Total Dissolved Solids	247	203.048	28.742	317	235.185	203	173.2	68.2
Physicals (Units)								
Oxygen Dissolved (mg/L)	303	10.233	1.874	14.97	12.86	10.15	7.94	5.55
pH – Field (pH units)	293	8.231	0.405	9.14	8.762	8.2	7.7	6.57
Sodium Adsorption Ratio (units)	250	0.299	0.114	1.016	0.425	0.272	0.205	0.05
Total Suspended Solids (mg/L)	308	84.279	283.797	2500	177.7	9.8	2.73	0.5
Metals (µg/L)								
Aluminum Dissolved	128	29.891	31.066	312	49.69	27.5	6.99	4.1
Aluminum Total	128	830.724	2191.537	18100	1882	130.5	48.33	13.4
Arsenic Dissolved	128	0.387	0.157	0.85	0.627	0.34	0.23	0.13
Arsenic Total	128	0.939	1.336	8.79	1.924	0.425	0.28	0.18
Barium Dissolved	128	64.494	7.725	83.1	73.28	64.7	56.16	33.2
Barium Total	128	93.706	74.807	791	136.9	73.4	63.45	47.7
Beryllium Dissolved	128	0.00256	0.00295	0.028	0.0057	0.002	0.00065	0.0005
Beryllium Total	128	0.0566	0.155	1.43	0.138	0.007	0.003	0.0005
Boron Dissolved	128	16.42	3.825	32.9	19.67	16.15	12.83	5.9
Boron Total	128	19.545	13.862	140	23.15	17.15	14.43	12
Cadmium Dissolved	128	0.0435	0.0658	0.515	0.119	0.02	0.011	0.004
Cadmium Total	128	0.0686	0.125	0.918	0.173	0.022	0.012	0.003
Chromium Dissolved	128	0.0797	0.0667	0.72	0.116	0.0645	0.049	0.023
Chromium Total	128	1.29	3.362	29.3	2.542	0.251	0.116	0.042
Cobalt Dissolved	128	0.0818	0.0438	0.324	0.123	0.0725	0.042	0.019
Cobalt Total	128	0.827	2.22	21.5	1.818	0.159	0.083	0.051
Copper Dissolved	128	0.785	0.397	2.3	1.258	0.655	0.46	0.33
Copper Total	128	2.596	4.895	44.2	6.271	0.935	0.643	0.38
Iron Dissolved	128	30.7	66.045	629	63.82	11.65	6.3	0.25
Iron Total	128	1533.041	4268.575	39600	3626	179.5	74.88	6.2
Lead Dissolved	128	0.0524	0.0652	0.562	0.097	0.034	0.0196	0.005
Lead Total	128	1.109	2.945	28.1	2.775	0.184	0.0953	0.027
Lithium Dissolved	128	4.898	1.223	10.8	6.4	4.66	3.751	2.23
Lithium Total	128	6.989	6.656	56.9	8.735	5.31	4.3	3.07
Manganese Dissolved	128	4.084	4.259	30.2	8.572	2.79	1.232	0.18
Manganese Total	128	53.973	129.868	1220	142.1	11.2	4.305	1.14
Molybdenum Dissolved	128	1.194	0.986	11.9	1.414	1.08	0.855	0.482
Molybdenum Total	128	1.218	0.958	11.5	1.477	1.13	0.782	0.456
Nickel Dissolved	128	0.953	0.471	2.92	1.51	0.8	0.59	0.4
Nickel Total	128	3.106	6.49	61.4	7.215	1.02	0.716	0.46
Selenium Dissolved	128	0.277	0.107	0.63	0.427	0.26	0.163	0.025
Selenium Total	128	0.314	0.139	0.92	0.477	0.29	0.183	0.025

Silver Total	128	0.0181	0.046	0.362	0.035	0.003	0.001	0.0005
Thallium Dissolved	128	0.00637	0.00459	0.04	0.01	0.005	0.003	0.0005
Thallium Total	128	0.0222	0.0433	0.387	0.0512	0.009	0.004	0.0005
Uranium Dissolved	128	0.52	0.0758	0.82	0.614	0.514	0.436	0.293
Uranium Total	128	0.636	0.254	2.28	0.809	0.563	0.498	0.361
Vanadium Dissolved	128	0.299	0.16	1.09	0.527	0.257	0.139	0.083
Vanadium Total	128	2.245	5.237	42.1	4.715	0.466	0.247	0.119
Zinc Dissolved	128	1.406	1.13	11.7	2.248	1.205	0.583	0.3
Zinc Total	128	7.515	17.251	160	16.36	2.045	1	0.22

Table A5: Red Deer River near Bindloss Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	400	0.044	0.082	0.800	0.100	0.018	0.007	0.003
Nitrate as N	565	0.22	0.329	3.84	0.53	0.075	0.005	0.0005
Nitrogen Total	230	1.066	1.519	16.490	2.202	0.629	0.360	0.182
Phosphorous Total	493	0.167	0.548	11	0.384	0.06	0.01	0.0015
Phosphorous Total Dissolved	462	0.0146	0.0184	0.18	0.032	0.008	0.003	0.001
Major Ions (mg/L)								
Chloride Dissolved	515	5.687	3.490	45.000	9.400	5.100	2.300	0.050
Fluoride Dissolved	458	0.157	0.042	0.600	0.200	0.160	0.120	0.017
Sodium Dissolved/Filtered	517	27.449	10.994	108.000	41.380	26.000	15.800	9.700
Sulphate Dissolved	516	67.331	22.709	236.000	95.950	64.050	43.610	24.000
Total Dissolved Solids	323	294.431	72.143	602.864	399.997	286.000	215.400	147.584
Physicals (Units)								
Oxygen Dissolved (mg/L)	471	9.325	2.781	18.300	12.764	9.200	6.292	0.380
pH – Field (pH units)	483	8.191	0.328	9.150	8.600	8.200	7.800	7.010
Sodium Adsorption Ratio (units)	414	0.848	0.338	2.849	1.214	0.787	0.495	0.358
Total Suspended Solids (mg/L)	511	261.428	658.528	6600.000	578.400	53.800	3.900	0.500
Metals (µg/L)								
Aluminum Dissolved	128	37.855	183.925	1600	16.21	3.4	1.03	0.1
Aluminum Total	128	2883.411	7262.61	58500	7569	622	56.39	2.1
Arsenic Dissolved	128	0.621	0.261	1.78	0.924	0.54	0.35	0.25
Arsenic Total	128	2.068	2.976	21.8	4.161	1.02	0.393	0.31
Barium Dissolved	128	93.765	20.009	153	122	89.65	70.41	46.3
Barium Total	128	188.504	174.364	1110	361.4	126	98.16	87.3
Beryllium Dissolved	128	0.00488	0.0165	0.145	0.007	0.001	0.0005	0.0005
Beryllium Total	128	0.269	0.648	4.77	0.673	0.051	0.005	0.0005
Boron Dissolved	128	24.622	6.014	44.1	33.4	23.5	17.5	13.4
Boron Total	128	27.598	6.955	50.9	37.18	25.95	19.88	15.5
Cadmium Dissolved	128	0.0391	0.0547	0.525	0.0679	0.0235	0.013	0.003
Cadmium Total	128	0.129	0.238	1.59	0.354	0.0435	0.019	0.009
Chromium Dissolved	128	0.158	0.415	3	0.215	0.06	0.0293	0.02
Chromium Total	127	3.453	8.507	70.4	9.982	0.79	0.122	0.057
Cobalt Dissolved	128	0.132	0.182	1.82	0.196	0.097	0.0492	0.029
Cobalt Total	128	2.781	6.055	39.4	6.592	0.659	0.0989	0.049
Copper Dissolved	128	1.737	1.283	10.4	3.095	1.34	0.813	0.22
Copper Total	128	8.362	15.788	110	19.67	2.865	0.979	0.73
Iron Dissolved	128	57.259	275.222	2620	76.65	6.25	2.6	0.7
Iron Total	128	4296.601	9720.748	67100	12790	887	75.13	5.2
Lead Dissolved	128	0.091	0.25	2.23	0.12	0.04	0.016	0.0025
Lead Total	128	4.015	9.048	60.1	11.58	0.686	0.11	0.007
Lithium Dissolved	128	13.049	4.738	34.8	18.9	11.9	8.2	0.77
Lithium Total	128	16.943	9.398	65.8	25.53	14.4	9.836	1.03
Manganese Dissolved	128	6.647	27.261	296	6.742	2.76	1.183	0.25
Manganese Total	128	146.948	263.941	1710	470.4	50.9	6.376	0.12
Molybdenum Dissolved	128	1.42	0.312	2.25	1.784	1.405	1.073	0.001
Molybdenum Total	128	1.233	0.397	3.07	1.671	1.255	0.744	0.002
Nickel Dissolved	128	1.792	1.041	8.35	3.088	1.52	0.863	0.006
Nickel Total	128	8.663	16.408	109	21.11	2.76	0.973	0.008
Selenium Dissolved	128	0.344	0.15	1.1	0.497	0.32	0.21	0.09
Selenium Total	128	0.403	0.278	2.02	0.617	0.335	0.213	0.025

Silver Total	128	0.0459	0.101	0.674	0.125	0.011	0.001	0.0005
Thallium Dissolved	128	0.0225	0.114	1.3	0.0207	0.01	0.005	0.0005
Thallium Total	128	0.0833	0.169	1.2	0.199	0.0245	0.008	0.001
Uranium Dissolved	128	1.316	0.402	3.62	1.837	1.225	0.934	0.785
Uranium Total	128	1.836	1.204	9.4	3.049	1.485	1.04	0.81
Vanadium Dissolved	128	0.562	0.521	4.97	0.872	0.489	0.184	0.141
Vanadium Total	128	6.851	14.643	116	19.5	1.925	0.339	0.194
Zinc Dissolved	128	1.352	1.671	13.1	2.205	0.96	0.313	0.025
Zinc Total	128	20.334	43.984	274	55.4	4.64	1.112	0.025

Table A6: South Saskatchewan Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	371	0.076	0.125	0.970	0.202	0.025	0.008	0.005
Nitrate as N	588	0.439	0.45	1.9	1.1	0.282	0.005	0.0005
Nitrogen Total	377	0.869	0.603	5.270	1.510	0.779	0.300	0.130
Phosphorous Total	566	0.0886	0.155	1.67	0.21	0.038	0.014	0.002
Phosphorous Total Dissolved	525	0.0159	0.0307	0.483	0.031	0.008	0.003	0.001
Major Ions (mg/L)								
Chloride Dissolved	460	7.127	4.886	63.5	12.8	6.31	2.445	0.05
Fluoride Dissolved	449	0.149	0.035	0.36	0.19	0.15	0.11	0.005
Sodium Dissolved/Filtered	464	17.728	6.971	52	26	17.15	9.772	4.1
Sulphate Dissolved	460	60.913	17.709	151	83.2	60.5	36.3	20.8
Total Dissolved Solids	319	238.022	46.641	399.544	295.144	232.5	178.312	98
Physicals (Units)								
Oxygen Dissolved (mg/L)	470	10.675	2.226	16.500	13.600	10.600	7.900	5.500
pH – Field (pH units)	476	8.315	0.367	9.320	8.730	8.390	7.800	7.100
Sodium Adsorption Ratio (units)	411	0.595	0.206	1.569	0.868	0.565	0.359	0.199
Total Suspended Solids (mg/L)	559	94.269	221.707	2150.000	249.200	19.000	4.000	0.500
Metals (µg/L)								
Aluminum Dissolved	128	16.098	46.906	506	17.14	10.05	5.16	1.5
Aluminum Total	128	952.154	3463.57	28200	1385	196.5	65.35	9.4
Arsenic Dissolved	128	0.509	0.173	1.24	0.717	0.495	0.31	0.21
Arsenic Total	128	1.034	1.542	12.5	1.648	0.67	0.403	0.31
Barium Total	128	102.922	79.978	748	126.4	87.5	75.26	41.9
Beryllium Dissolved	128	0.00235	0.00493	0.039	0.0037	0.001	0.0005	0.0005
Beryllium Total	128	0.0619	0.19	1.51	0.116	0.0155	0.005	0.0005
Boron Dissolved	128	20.952	4.528	33	27.04	20.8	14.63	11.8
Boron Total	128	22.405	4.677	39.8	28.04	21.95	16.65	12.4
Cadmium Dissolved	128	0.0353	0.0857	0.935	0.0571	0.02	0.009	0.0005
Cadmium Total	128	0.0692	0.175	1.24	0.0857	0.024	0.014	0.007
Chromium Dissolved	128	0.122	0.275	2.82	0.201	0.0695	0.0403	0.019
Chromium Total	128	1.254	4.105	32.8	2.143	0.294	0.14	0.06
Cobalt Dissolved	128	0.105	0.0533	0.472	0.153	0.0995	0.0566	0.035
Cobalt Total	128	0.791	2.27	19.5	1.381	0.249	0.124	0.058
Copper Dissolved	128	0.956	0.327	2.06	1.454	0.89	0.626	0.44
Copper Total	128	2.641	5.551	46.5	4.269	1.305	0.86	0.67
Iron Dissolved	128	20.52	75.654	794	26.67	7.9	4.9	1.8
Iron Total	128	1428.694	4923.381	41300	2544	285.5	102.9	11.2
Lead Dissolved	128	0.0498	0.0645	0.618	0.0805	0.037	0.0173	0.0025
Lead Total	128	1.107	3.345	28.6	2.168	0.279	0.129	0.043
Lithium Dissolved	128	8.229	2.528	20.7	11.6	7.765	5.553	4.7
Lithium Total	128	9.773	4.586	41.8	13.07	8.5	6.727	5.71
Manganese Dissolved	128	2.115	3.199	26.5	3.308	1.39	0.662	0.37
Manganese Total	128	48.532	130.393	1060	91.7	14.35	4.849	2.23
Molybdenum Dissolved	128	1.364	0.335	2.81	1.733	1.335	0.983	0.769
Molybdenum Total	128	1.341	0.393	2.96	1.771	1.325	0.834	0.443
Nickel Dissolved	128	0.971	0.345	2.43	1.338	0.885	0.67	0.22
Nickel Total	128	2.794	6.263	51.2	4.553	1.27	0.873	0.66
Selenium Dissolved	128	0.562	0.146	1.05	0.74	0.57	0.39	0.21
Selenium Total	128	0.6	0.197	1.34	0.82	0.57	0.403	0.025
Silver Total	128	0.0175	0.0593	0.419	0.027	0.003	0.00065	0.0005

Thallium Dissolved	128	0.00718	0.00508	0.043	0.011	0.006	0.003	0.0005
Thallium Total	128	0.0244	0.054	0.454	0.0431	0.011	0.006	0.003
Uranium Dissolved	128	1.017	0.258	2.36	1.307	0.986	0.733	0.246
Uranium Total	128	1.18	0.539	5.2	1.445	1.05	0.804	0.7
Vanadium Dissolved	128	0.305	0.17	1.41	0.497	0.259	0.152	0.117
Vanadium Total	128	2.433	7.345	57	3.905	0.721	0.329	0.147
Zinc Dissolved	128	1.385	0.967	4.98	2.563	1.145	0.415	0.19
Zinc Total	128	6.98	18.547	147	12.21	2.49	1.106	0.06

Table A7: Assiniboine River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	331	0.175	0.252	2.520	0.476	0.067	0.026	0.003
Nitrate as N	523	0.229	0.436	4.75	0.686	0.05	0.005	0.0005
Nitrogen Total	228	1.622	0.639	5.519	2.433	1.521	1.050	0.716
Phosphorous Total	510	0.153	0.125	1.176	0.27	0.12	0.0575	0.013
Phosphorous Total Dissolved	472	0.0888	0.104	1.067	0.16	0.059	0.028	0.007
Major Ions (mg/L)								
Chloride Dissolved	504	24.02	19.273	155	42	19.35	8.7	1.6
Fluoride Dissolved	492	0.199	0.0671	0.69	0.26	0.19	0.14	0.04
Sodium Dissolved/Filtered	506	46.029	23.756	203	69.36	43.65	21.62	3.7
Sulphate Dissolved	494	211.434	79.715	609	319	204.5	117	38
Total Dissolved Solids	376	659.398	180.013	1440	864.703	663.644	443.2	2
Physicals (Units)								
Oxygen Dissolved (mg/L)	466	8.152	2.673	17.89	11.74	8	4.884	0.1
pH – Field (pH units)	490	7.887	0.381	10.94	8.3	7.9	7.4	6.5
Sodium Adsorption Ratio (units)	455	0.928	0.410	3.671	1.276	0.876	0.567	0.071
Total Suspended Solids (mg/L)	487	24.204	33.604	357	58.72	12.4	4	0.5
Metals (µg/L)								
Aluminum Dissolved	127	15.235	68.127	595	7.38	2.8	1.42	0.05
Aluminum Total	127	248.87	288.111	2360	590	128	60.84	3.5
Arsenic Dissolved	127	2.979	1.763	12.7	5.216	2.38	1.464	1.11
Arsenic Total	127	3.749	2.065	16	6.178	3.1	2.024	1.32
Barium Dissolved	127	56.086	10.307	86.3	68	57.1	41.58	29.7
Barium Total	127	65.035	11.246	96.5	79.02	65.4	50.28	39.5
Beryllium Dissolved	127	0.0041	0.0054	0.046	0.0078	0.003	0.0005	0.0005
Beryllium Total	127	0.0199	0.02	0.164	0.0438	0.013	0.005	0.0005
Boron Dissolved	127	78.232	19.528	147	100.68	78.1	53.7	29.8
Boron Total	127	81.983	26.268	273	105.6	80.1	55.36	34.7
Cadmium Dissolved	127	0.0537	0.127	1.18	0.0892	0.024	0.013	0.008
Cadmium Total	127	0.0374	0.026	0.263	0.057	0.029	0.019	0.012
Chromium Dissolved	127	0.731	2.187	12.09	1.138	0.069	0.0352	0.028
Chromium Total	127	0.482	0.484	4.53	0.996	0.32	0.152	0.07
Cobalt Dissolved	127	0.373	0.127	1.06	0.52	0.348	0.258	0.17
Cobalt Total	127	0.645	0.373	3.23	1.126	0.525	0.339	0.234
Copper Dissolved	127	1.349	0.685	6.03	1.938	1.17	0.912	0.69
Copper Total	127	2.002	1.087	9.44	3.286	1.62	1.122	0.85
Iron Dissolved	127	83.144	189.044	1720	133.8	35.3	9.8	4.9
Iron Total	127	836.25	715.716	6410	1570	609	320.4	4.2
Lead Dissolved	127	0.069	0.125	1.03	0.122	0.037	0.0142	0.00125
Lead Total	127	0.476	0.437	3.75	0.942	0.306	0.162	0.043
Lithium Dissolved	127	59.87	18.064	123	78.96	59.4	38.72	15.9
Lithium Total	127	62.084	18.212	130	79.34	60.9	39.34	19.3
Manganese Dissolved	127	145.76	154.019	1130	332.4	94.9	14.42	2.12
Manganese Total	127	240.58	144.122	1160	389.8	227	96.68	45.8
Molybdenum Dissolved	127	2.342	0.683	5.08	3.082	2.28	1.602	1.2
Molybdenum Total	127	2.403	0.706	5.03	3.43	2.32	1.66	1.21
Nickel Dissolved	127	2.791	0.559	4.78	3.586	2.76	2.152	1.82
Nickel Total	127	3.497	1.099	10.7	4.828	3.25	2.426	2
Selenium Dissolved	127	0.394	0.177	1.23	0.618	0.35	0.22	0.1
Selenium Total	127	0.423	0.218	1.48	0.638	0.38	0.24	0.025

Silver Total	127	0.0061	0.00651	0.036	0.0148	0.004	0.0005	0.0005
Thallium Dissolved	127	0.0132	0.0225	0.232	0.02	0.009	0.004	0.001
Thallium Total	127	0.0199	0.0237	0.24	0.0346	0.015	0.007	0.003
Uranium Dissolved	127	4.595	1.711	11.2	6.918	4.27	2.852	2.35
Uranium Total	127	4.697	1.677	11.2	6.874	4.26	3.11	2.38
Vanadium Dissolved	127	1.236	0.782	3.88	2.43	1.12	0.412	0.337
Vanadium Total	127	2.226	1.516	10.6	4.156	1.84	0.8	0.412
Zinc Dissolved	127	1.536	1.399	7.6	3.466	1.22	0.308	0.19
Zinc Total	127	3.677	3.228	29.2	6.53	2.6	1.408	0.76

Table A8: Carrot River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	360	0.177	0.236	1.540	0.471	0.057	0.024	0.008
Nitrate as N	446	0.102	0.235	2.16	0.22	0.0285	0.005	0.004
Nitrogen Total	235	1.1973	0.597	5.831	1.813	1.081	0.635	0.385
Phosphorous Total	439	0.0943	0.0887	0.597	0.21	0.061	0.0284	0.0025
Phosphorous Total Dissolved	421	0.0273	0.0306	0.28	0.0634	0.017	0.006	0.0015
Major Ions (mg/L)								
Chloride Dissolved	391	224.808	215.988	1280	520.8	149	33	2.2
Fluoride Dissolved	393	0.177	0.0555	0.46	0.25	0.16	0.12	0.05
Sodium Dissolved/Filtered	393	145.033	133.159	800	338.4	98.6	28.96	8.4
Sulphate Dissolved	395	68.266	34.47	202	116	60.8	31.1	6
Total Dissolved Solids	302	694.804	437.705	2769	1299.918	543.858	296.774	167.3
Physicals (Units)								
Oxygen Dissolved (mg/L)	425	6.58	3.94	17.74	11.5	7.1	0.6	0.02
pH – Field (pH units)	441	7.624	0.361	9.67	8.07	7.61	7.196	6.53
Sodium Adsorption Ratio (units)	380	3.316	2.525	13.177	7.118	2.585	0.854	0.299
Total Suspended Solids (mg/L)	442	43.674	86.311	1083	100	15	5.94	0.5
Metals (µg/L)								
Aluminum Dissolved	107	12.49	59.791	612	12.32	4.1	1.32	0.1
Aluminum Total	107	309.2	436.432	2280	858.4	144	40.42	3.1
Arsenic Dissolved	107	1.572	0.697	3.34	2.708	1.34	0.904	0.11
Arsenic Total	107	2.304	0.88	5.2	3.584	2.08	1.386	1.09
Barium Dissolved	107	69.065	29.725	187	113.2	61.1	42.94	12.6
Barium Total	107	83.145	33.194	198	139.4	73.9	49.8	32.9
Beryllium Dissolved	107	0.0055	0.00533	0.051	0.009	0.005	0.002	0.0005
Beryllium Total	107	0.0266	0.0328	0.211	0.0556	0.015	0.0082	0.005
Boron Dissolved	107	72.493	41.065	285	126.4	65.3	34.46	15.8
Boron Total	107	75.057	39.169	261	123.8	65.3	37.18	29.7
Cadmium Dissolved	107	0.0342	0.0348	0.221	0.056	0.022	0.013	0.003
Cadmium Total	107	0.0403	0.0405	0.263	0.0688	0.028	0.0172	0.011
Chromium Dissolved	107	0.13	0.358	3.46	0.138	0.07	0.04	0.011
Chromium Total	107	0.712	0.936	5.66	1.604	0.391	0.171	0.067
Cobalt Dissolved	107	0.399	0.288	1.47	0.862	0.289	0.155	0.099
Cobalt Total	107	0.717	0.559	4.16	1.246	0.529	0.323	0.203
Copper Dissolved	107	1.057	0.546	3.84	1.598	1.04	0.342	0.04
Copper Total	107	1.866	1.478	9.71	3.1	1.44	0.744	0.39
Iron Dissolved	107	298.2	465.076	3170	757	130	64.78	21.7
Iron Total	107	1564.2	1331.746	6700	3648	1050	469.4	105
Lead Dissolved	107	0.0727	0.092	0.626	0.13	0.047	0.02	0.0025
Lead Total	107	0.453	0.568	3.73	0.972	0.267	0.113	0.016
Lithium Dissolved	107	32.877	14.854	94.2	50.4	30.1	16.52	5.7
Lithium Total	107	34.547	14.303	87.2	51.06	31.7	18.52	9.9
Manganese Dissolved	107	470.21	653.504	2890	1610	118	43.12	2.71
Manganese Total	107	556.78	672.643	2910	1638	229	87.04	49.9
Molybdenum Dissolved	107	1.746	0.6	3.7	2.594	1.62	1.122	0.219
Molybdenum Total	107	1.78	0.561	3.68	2.508	1.69	1.186	0.918
Nickel Dissolved	107	2.679	0.572	5.43	3.226	2.68	2.124	0.25
Nickel Total	107	3.612	1.693	14	5.336	3.1	2.602	1.47
Selenium Dissolved	107	0.279	0.157	1.05	0.38	0.25	0.16	0.025
Selenium Total	107	0.304	0.161	1.07	0.448	0.26	0.19	0.14

Silver Total	107	0.0075	0.0101	0.061	0.0198	0.004	0.0006	0.0005
Thallium Dissolved	107	0.0161	0.0316	0.258	0.022	0.01	0.004	0.0005
Thallium Total	107	0.0246	0.0285	0.198	0.0368	0.016	0.008	0.002
Uranium Dissolved	107	1.415	0.635	3.73	2.384	1.37	0.65	0.0974
Uranium Total	107	1.506	0.62	3.8	2.406	1.45	0.74	0.445
Vanadium Dissolved	107	0.54	0.369	2.89	0.939	0.46	0.159	0.0025
Vanadium Total	107	1.724	1.672	10.8	3.466	1.22	0.527	0.19
Zinc Dissolved	107	1.228	1.139	8.88	2.28	0.9	0.4	0.23
Zinc Total	107	3.42	4.435	27.7	6.97	1.8	1.092	0.36

Table A9: Churchill River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	167	0.026	0.026	0.260	0.050	0.018	0.007	0.005
Nitrate as N	239	0.0274	0.0778	1.1	0.0592	0.005	0.005	0.003
Nitrogen Total	78	0.393	0.147	1.539	0.473	0.372	0.292	0.267
Phosphorous Total	238	0.0184	0.0186	0.195	0.0247	0.0155	0.008	0.004
Phosphorous Total Dissolved	220	0.00691	0.00651	0.084	0.01	0.006	0.003	0.001
Major Ions (mg/L)								
Chloride Dissolved	240	1.32	0.609	6.4	1.9	1.2	0.87	0.005
Fluoride Dissolved	240	0.0968	0.0237	0.24	0.12	0.09	0.08	0.005
Sodium Dissolved/Filtered	240	3.175	0.974	12.3	4.255	3	2.275	1.72
Sulphate Dissolved	240	3.03	2.387	37	4	2.7	2	0.6
Total Dissolved Solids	175	44.342	17.174	195.034	59	42	31.284	0.0005
Physicals (Units)								
Oxygen Dissolved (mg/L)	227	11.166	2.364	18	14.2	10.99	8.3	6.16
pH – Field (pH units)	232	7.461	0.449	8.46	8.058	7.485	6.9	6.2
Sodium Adsorption Ratio (units)	231	0.224	0.034	0.434	0.266	0.220	0.188	0.150
Total Suspended Solids (mg/L)	234	3.411	2.687	26	6	3	0.89	0.5
Metals (µg/L)								
Aluminum Dissolved	37	22.995	12.224	55.8	36.92	22.2	8.44	3.8
Aluminum Total	37	126.01	76.907	399	213.8	120	43.56	28.4
Arsenic Dissolved	37	0.286	0.087	0.71	0.356	0.28	0.212	0.18
Arsenic Total	37	0.322	0.14	1.09	0.378	0.3	0.24	0.21
Barium Dissolved	37	14.715	8.479	63.3	16.48	13.5	10.1	9.1
Barium Total	37	16.632	9.911	73.5	18.9	15.4	11.8	10.3
Beryllium Dissolved	37	0.0028	0.00139	0.006	0.005	0.003	0.0006	0.0005
Beryllium Total	37	0.0076	0.00462	0.028	0.0118	0.007	0.0032	0.0005
Boron Dissolved	37	11.346	2.424	18.5	14.5	11.4	8.56	6.1
Boron Total	37	11.649	2.598	18.9	14.7	11.6	8.82	6.3
Cadmium Dissolved	37	0.0136	0.0115	0.048	0.0292	0.009	0.0022	0.002
Cadmium Total	37	0.0089	0.0108	0.062	0.02	0.005	0.004	0.001
Chromium Dissolved	37	0.102	0.043	0.27	0.148	0.095	0.0608	0.042
Chromium Total	37	0.324	0.148	0.85	0.477	0.304	0.158	0.13
Cobalt Dissolved	37	0.0157	0.00921	0.066	0.0188	0.015	0.0112	0.001
Cobalt Total	37	0.0727	0.0696	0.45	0.104	0.065	0.0286	0.023
Copper Dissolved	37	0.544	0.172	1.11	0.784	0.51	0.37	0.26
Copper Total	37	0.639	0.277	1.88	0.886	0.58	0.414	0.28
Iron Dissolved	37	26.581	15.809	88.2	44.5	21.4	12.6	9
Iron Total	37	164.36	142.557	910	237.6	142	60.96	47.6
Lead Dissolved	37	0.0264	0.0289	0.157	0.0468	0.018	0.0092	0.0025
Lead Total	37	0.1	0.11	0.697	0.108	0.08	0.039	0.029
Lithium Dissolved	37	3.799	0.89	8	4.58	3.77	2.92	2.6
Lithium Total	37	3.988	0.966	8.8	4.68	3.97	3.12	2.9
Manganese Dissolved	37	1.064	0.558	3.03	1.486	1.03	0.524	0.43
Manganese Total	37	15.628	8.658	37.7	28.38	12.2	7.496	4.58
Molybdenum Dissolved	37	0.169	0.134	0.933	0.197	0.144	0.117	0.079
Molybdenum Total	37	0.17	0.128	0.908	0.195	0.147	0.119	0.088
Nickel Dissolved	37	0.319	0.128	1.01	0.38	0.3	0.232	0.21
Nickel Total	37	0.455	0.277	1.98	0.586	0.42	0.28	0.24
Thallium Dissolved	37	0.0035	0.00897	0.056	0.0046	0.002	0.0006	0.0005
Thallium Total	37	0.0052	0.00684	0.043	0.0076	0.004	0.0012	0.0005

Uranium Dissolved	37	0.447	1.186	5.67	1.323	0.063	0.0407	0.0299
Uranium Total	37	0.0861	0.0992	0.664	0.0927	0.0702	0.0442	0.0351
Vanadium Dissolved	37	0.151	0.0685	0.378	0.239	0.152	0.0751	0.0519
Vanadium Total	37	0.378	0.241	1.53	0.538	0.341	0.146	0.115
Zinc Dissolved	37	0.607	0.314	1.26	1.186	0.53	0.244	0.18
Zinc Total	37	0.822	0.673	3.65	1.19	0.61	0.4	0.3

Table A10: Qu'Appelle River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	364	0.063	0.084	1.070	0.122	0.044	0.021	0.001
Nitrate as N	429	0.134	0.184	1.34	0.35	0.05	0.005	0.005
Nitrogen Total	208	1.362	0.529	4.375	1.908	1.216	0.943	0.346
Phosphorous Total	428	0.207	0.0891	0.68	0.309	0.19	0.115	0.029
Phosphorous Total Dissolved	428	0.131	0.0677	0.436	0.23	0.123	0.0513	0.01
Major Ions (mg/L)								
Chloride Dissolved	389	72.239	19.019	124	95.18	73.9	47	10
Fluoride Dissolved	392	0.205	0.0446	0.57	0.25	0.21	0.16	0.02
Sodium Dissolved/Filtered	389	157.599	37.882	244	205.6	162	110	23.6
Sulphate Dissolved	391	399.506	83.94	591	490.4	412	300	16.7
Total Dissolved Solids	323	957.067	165.591	1358	1141.12	978.652	785.635	226.666
Physicals (Units)								
Oxygen Dissolved (mg/L)	419	9.602	2.251	15.7	12.388	9.73	6.56	0.7
pH – Field (pH units)	423	8.161	0.305	9.29	8.5	8.2	7.8	6.48
Sodium Adsorption Ratio (units)	367	3.310	0.788	5.668	4.267	3.398	2.254	0.532
Total Suspended Solids (mg/L)	431	59.063	74.228	917	132	35	9.2	0.5
Metals (µg/L)								
Aluminum Dissolved	106	6.974	20.059	184	8.4	2.75	1.1	0.1
Aluminum Total	106	432.57	679.339	5130	1044.8	195.5	0.151	0.025
Arsenic Dissolved	106	6.162	2.08	12	8.916	5.975	3.577	1.73
Arsenic Total	106	6.872	2.037	12.7	9.346	6.82	4.284	2.94
Barium Dissolved	106	52.779	7.668	78.3	61.56	52.15	45.7	24
Barium Total	106	69.125	20.666	218	88.23	63.15	54.73	27.1
Beryllium Dissolved	106	0.0059	0.00645	0.033	0.014	0.004	0.0005	0.0005
Beryllium Total	106	0.0363	0.0463	0.387	0.078	0.022	0.008	0.003
Boron Dissolved	106	207.65	48.501	308	259.9	219	141.2	72.8
Boron Total	106	210.93	50.051	313	263.8	221.5	140.5	68.2
Cadmium Dissolved	106	0.0431	0.0748	0.674	0.0748	0.024	0.012	0.009
Cadmium Total	106	0.0354	0.0295	0.265	0.066	0.026	0.017	0.012
Chromium Dissolved	106	0.11	0.28	2.82	0.178	0.05	0.0303	0.0025
Chromium Total	106	0.797	1.097	9.14	1.808	0.398	0.208	0.08
Cobalt Dissolved	106	0.273	0.101	0.647	0.401	0.257	0.161	0.118
Cobalt Total	106	0.801	0.83	7.4	1.55	0.55	0.296	0.197
Copper Dissolved	106	1.395	0.709	5.7	1.919	1.24	0.851	0.74
Copper Total	106	2.442	1.936	17	4.307	1.745	1.173	0.71
Iron Dissolved	106	18.465	48.694	459	30.63	7.05	3.4	1.1
Iron Total	106	967.26	1378.582	11700	2298	447.5	234.1	122
Lead Dissolved	106	0.0517	0.113	1.09	0.095	0.0255	0.009	0.0025
Lead Total	106	0.694	0.985	8.59	1.515	0.35	0.154	0.091
Lithium Dissolved	106	95.659	17.244	132	115.9	96.85	76.81	39
Lithium Total	106	98.384	17.397	137	118.9	101	80.1	40.5
Manganese Dissolved	106	69.589	76.471	484	153.5	50.35	3.841	1.07
Manganese Total	106	205.69	173.527	1560	347.9	151.5	82.49	49.8
Molybdenum Dissolved	106	4.14	0.679	5.37	4.969	4.085	3.302	2.05
Molybdenum Total	106	4.126	0.787	5.34	5.009	4.235	3.122	1.51
Nickel Dissolved	106	3.432	0.602	5.02	4.329	3.315	2.703	2.12
Nickel Total	106	4.848	2.384	22.6	7.362	4.215	3.063	2.08
Selenium Dissolved	106	0.538	0.273	2.04	0.758	0.47	0.331	0.17
Selenium Total	106	0.568	0.276	2.1	0.777	0.505	0.37	0.1

Silver Total	106	0.0063	0.00812	0.048	0.0169	0.003	0.0005	0.0005
Thallium Dissolved	106	0.0124	0.0255	0.199	0.017	0.008	0.003	0.0005
Thallium Total	106	0.0216	0.0265	0.194	0.0349	0.015	0.006	0.002
Uranium Dissolved	106	2.811	0.763	5.03	4.026	2.525	2.163	1.03
Uranium Total	106	2.947	0.773	5.61	4.118	2.685	2.24	1.1
Vanadium Dissolved	106	2.203	0.913	5.09	3.414	2.085	1.13	0.663
Vanadium Total	106	3.84	2.611	19.6	6.222	3.145	1.701	1.06
Zinc Dissolved	106	1.044	1.507	13.9	2.127	0.625	0.203	0.07
Zinc Total	106	4.865	6.835	61.2	11.09	2.57	1.201	0.73

Table A11: Red Deer River at Erwood Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	265	0.067	0.121	1.300	0.145	0.034	0.017	0.009
Nitrate as N	394	0.178	0.302	2.25	0.607	0.0215	0.005	0.0005
Nitrogen Total	127	1.167	0.447	2.780	1.753	1.096	0.675	0.480
Phosphorous Total	352	0.051	0.0672	0.56	0.106	0.027	0.014	0.008
Phosphorous Total Dissolved	312	0.0222	0.026	0.25	0.045	0.014	0.008	0.0015
Major Ions (mg/L)								
Chloride Dissolved	400	5.192	2.778	25	8.05	4.5	2.6	0.5
Fluoride Dissolved	372	0.137	0.0401	0.35	0.18	0.13	0.09	0.05
Sodium Dissolved/Filtered	400	15.197	7.589	76.3	23.8	13.95	7.825	1.8
Sulphate Dissolved	400	69.347	37.043	314	114	65.9	27.65	2.26
Total Dissolved Solids	261	332.794	130.217	824.498	510.171	294	184.359	46.024
Physicals (Units)								
Oxygen Dissolved (mg/L)	340	10.085	2.52	16.61	13.2	10.2	7	1
pH – Field (pH units)	351	7.989	0.445	10.9	8.5	8	7.4	6.56
Sodium Adsorption Ratio (units)	330	0.395	0.117	0.922	0.528	0.384	0.265	0.042
Total Suspended Solids (mg/L)	353	15.149	34.527	346	38.2	3.8	1	0.5
Metals (µg/L)								
Aluminum Dissolved	69	8.407	11.46	83	14.78	5.5	2.74	0.1
Aluminum Total	69	188.03	275.363	1370	571.6	65.9	27.94	12
Arsenic Dissolved	69	1.212	0.434	2.48	1.924	1.05	0.838	0.25
Arsenic Total	69	1.558	0.569	3.13	2.338	1.53	0.972	0.28
Barium Dissolved	69	38.158	10.906	71.2	52.42	36.4	25.84	12
Barium Total	69	44.717	11.9	75.7	56.92	44.5	31.58	14.3
Beryllium Dissolved	69	0.0052	0.00299	0.019	0.008	0.004	0.003	0.0005
Beryllium Total	69	0.0193	0.0223	0.119	0.0436	0.011	0.005	0.0005
Boron Dissolved	69	46.41	14.102	84.3	64.84	44	28.7	9.3
Boron Total	69	47.38	12.929	76.8	65.3	48.2	30.5	9.8
Cadmium Dissolved	69	0.0301	0.0356	0.29	0.0556	0.022	0.012	0.002
Cadmium Total	69	0.0428	0.0427	0.212	0.0884	0.023	0.0144	0.007
Chromium Dissolved	69	0.0904	0.0492	0.25	0.155	0.073	0.05	0.03
Chromium Total	69	0.548	0.682	3.19	1.462	0.235	0.118	0.07
Cobalt Dissolved	69	0.162	0.0655	0.33	0.248	0.173	0.0806	0.015
Cobalt Total	69	0.385	0.36	1.85	0.829	0.266	0.106	0.066
Copper Dissolved	69	0.994	0.269	1.65	1.39	0.97	0.67	0.45
Copper Total	69	1.534	1.086	6.69	3.02	1.18	0.748	0.55
Iron Dissolved	69	92.523	70.405	311	179	65.9	31.18	17.7
Iron Total	69	712.89	837.091	3610	1962	330	187.4	48.3
Lead Dissolved	69	0.0454	0.0405	0.211	0.099	0.033	0.0154	0.0025
Lead Total	69	0.325	0.41	2.15	0.884	0.152	0.061	0.032
Lithium Dissolved	69	26.755	8.899	44.6	39.76	26.4	16.78	3
Lithium Total	69	27.458	8.492	42.8	39.18	27.7	17.14	3.4
Manganese Dissolved	69	26.804	33.066	217	59.6	16.5	6.43	0.81
Manganese Total	69	93.332	96.038	510	219.8	69	18.92	7.8
Molybdenum Dissolved	69	1.702	0.598	3.5	2.372	1.53	1.138	0.128
Molybdenum Total	69	1.747	0.576	3.53	2.388	1.62	1.21	0.136
Nickel Dissolved	69	1.839	0.436	2.72	2.366	1.83	1.358	0.33
Nickel Total	69	2.419	1.067	6.99	3.774	2.17	1.432	0.45
Selenium Dissolved	69	0.253	0.115	0.82	0.386	0.23	0.14	0.025
Selenium Total	69	0.276	0.123	0.73	0.466	0.25	0.13	0.05

Silver Total	69	0.0057	0.0087	0.046	0.0142	0.002	0.0005	0.0005
Thallium Dissolved	69	0.0108	0.0114	0.099	0.014	0.01	0.0044	0.001
Thallium Total	69	0.0186	0.0161	0.092	0.0406	0.014	0.007	0.003
Uranium Dissolved	69	1.75	0.717	4.04	2.626	1.74	0.813	0.0487
Uranium Total	69	1.826	0.725	4.07	2.756	1.84	0.909	0.0603
Vanadium Dissolved	69	0.676	0.319	1.44	1.106	0.619	0.351	0.139
Vanadium Total	69	1.497	1.266	6.77	3.31	1.16	0.507	0.349
Zinc Dissolved	69	1.208	1.173	7.16	2.218	0.88	0.36	0.2
Zinc Total	69	3.087	3.811	19	6.986	1.5	0.7	0.3

Table A12: Saskatchewan River Statistics

Parameter	n	Mean	SD	Max	90th %ile	Median	10th %ile	Min
Nutrients (mg/L)								
Ammonia Dissolved	332	0.042	0.039	0.410	0.083	0.028	0.012	0.003
Nitrate as N	413	0.117	0.14	1.17	0.326	0.05	0.005	0.002
Nitrogen Total	199	0.623	0.220	2.617	0.804	0.590	0.409	0.328
Phosphorous Total	413	0.0543	0.0443	0.446	0.107	0.042	0.019	0.009
Phosphorous Total Dissolved	394	0.0109	0.0106	0.148	0.017	0.009	0.005	0.001
Major Ions (mg/L)								
Chloride Dissolved	413	8.974	16.614	300	9.928	7.4	5.3	3.6
Fluoride Dissolved	413	0.143	0.0315	0.3	0.18	0.14	0.11	0.0176
Sodium Dissolved/Filtered	413	17.499	10.077	183	21.1	16.5	12.8	2.44
Sulphate Dissolved	413	50.668	12.712	157	65.2	49.7	36.78	25
Total Dissolved Solids	322	229.58	53.45	746.174	274.351	220.807	184.656	146
Physicals (Units)								
Oxygen Dissolved (mg/L)	398	10.143	2.254	15.9	12.9	10.26	7.2	3.5
pH – Field (pH units)	403	7.985	0.367	10.88	8.372	8	7.55	6.98
Sodium Adsorption Ratio (units)	402	0.578	0.241	4.317	0.663	0.559	0.454	0.152
Total Suspended Solids (mg/L)	412	48.124	47.523	392	105.3	35	7.34	0.5
Metals (µg/L)								
Aluminum Dissolved	109	7.974	14.134	147	11.3	5.7	2.4	0.1
Aluminum Total	109	503.13	537.115	3120	1088	296	90.38	51.8
Arsenic Dissolved	109	0.799	0.219	1.46	1.11	0.75	0.56	0.48
Arsenic Total	109	1.184	0.443	3.07	1.77	1.16	0.714	0.42
Barium Dissolved	109	74.217	11.653	116	87.9	74	61.96	42.8
Barium Total	109	86.39	13.192	162	101.6	84.5	74.14	53.5
Beryllium Dissolved	109	0.0024	0.00193	0.012	0.005	0.002	0.0005	0.0005
Beryllium Total	109	0.0326	0.0315	0.154	0.071	0.022	0.006	0.002
Boron Dissolved	109	25.202	4.471	43.7	31.16	25	19.4	15.1
Boron Total	109	25.704	4.122	41.2	30.54	25.3	20.44	18
Cadmium Dissolved	109	0.0216	0.0196	0.152	0.0384	0.016	0.009	0.004
Cadmium Total	109	0.0294	0.0234	0.215	0.0462	0.025	0.013	0.01
Chromium Dissolved	109	0.0571	0.035	0.283	0.102	0.046	0.03	0.02
Chromium Total	109	0.929	0.823	4.46	1.86	0.651	0.242	0.127
Cobalt Dissolved	109	0.0688	0.0254	0.205	0.0856	0.064	0.05	0.035
Cobalt Total	109	0.468	0.411	2.23	0.955	0.322	0.133	0.105
Copper Dissolved	109	1.237	0.294	2.45	1.528	1.21	0.928	0.6
Copper Total	109	2.092	0.919	5.8	3.112	1.85	1.194	0.97
Iron Dissolved	109	29.594	40.45	352	58.86	19.4	5.94	2.2
Iron Total	109	929.61	878.221	4420	1992	582	223.8	116
Lead Dissolved	109	0.0332	0.0383	0.311	0.0556	0.023	0.011	0.0025
Lead Total	109	0.549	0.488	2.7	1.09	0.389	0.131	0.089
Lithium Dissolved	109	10.785	2.453	19.6	13.64	10.6	7.988	6.2
Lithium Total	109	11.565	2.324	21.5	14.26	11.2	9	7.4
Manganese Dissolved	109	7.509	10.326	46.2	22.98	2.63	0.772	0.44
Manganese Total	109	41.156	28.766	180	75.4	33.5	13.72	10.1
Molybdenum Dissolved	109	1.157	0.204	1.72	1.446	1.14	0.918	0.661
Molybdenum Total	109	1.139	0.216	1.77	1.422	1.12	0.874	0.719
Nickel Dissolved	109	1.285	0.247	2.23	1.582	1.23	1.054	0.9
Nickel Total	109	2.396	1.164	7.43	3.596	2.06	1.444	1.22
Selenium Dissolved	109	0.286	0.288	3.14	0.366	0.25	0.18	0.025
Selenium Total	109	0.279	0.0793	0.6	0.38	0.27	0.19	0.13

Silver Total	109	0.0076	0.00716	0.035	0.018	0.005	0.001	0.0005
Thallium Dissolved	109	0.0091	0.0203	0.198	0.0116	0.005	0.003	0.001
Thallium Total	109	0.0179	0.02	0.193	0.0306	0.014	0.006	0.004
Uranium Dissolved	109	0.837	0.18	1.48	1.056	0.835	0.601	0.418
Uranium Total	109	0.885	0.157	1.43	1.076	0.861	0.688	0.605
Vanadium Dissolved	109	0.421	0.173	0.929	0.678	0.379	0.236	0.209
Vanadium Total	109	1.702	1.341	6.88	3.37	1.3	0.532	0.421
Zinc Dissolved	109	0.739	0.462	2.84	1.406	0.6	0.28	0.1
Zinc Total	109	3.743	3.097	16.7	7.538	2.74	1.08	0.5

Appendix B: Nutrients Trending Graphs

Time Series

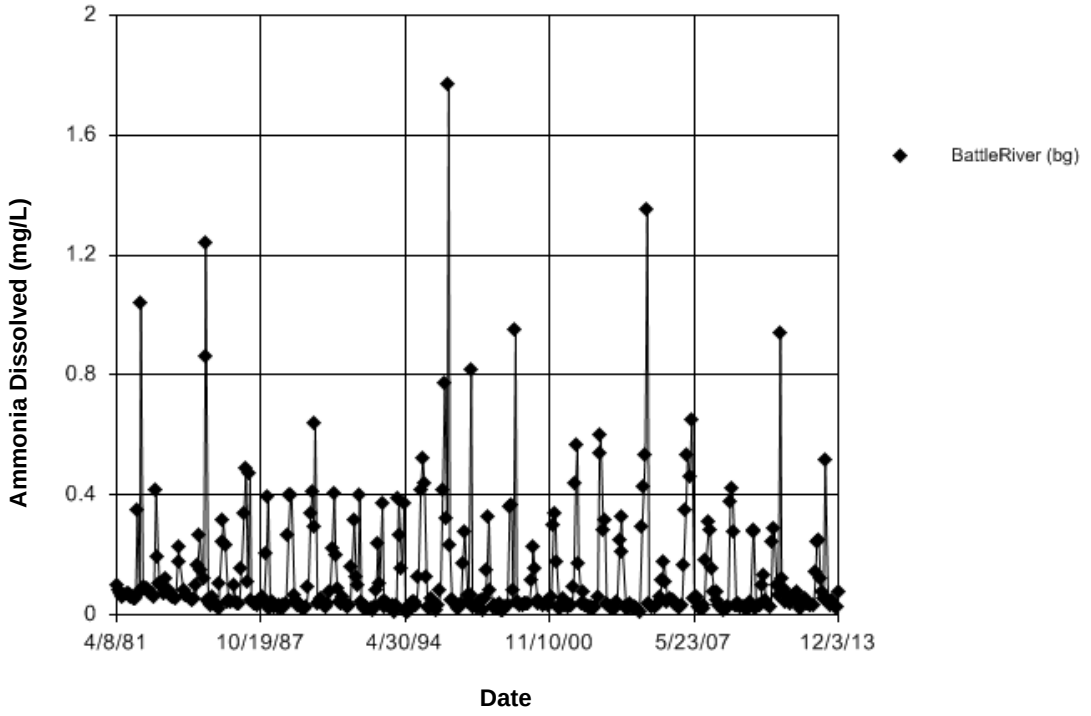


Figure B1 Battle River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 65.1
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 65.1
Adjusted Kruskal-Wallis statistic (H') = 65.1

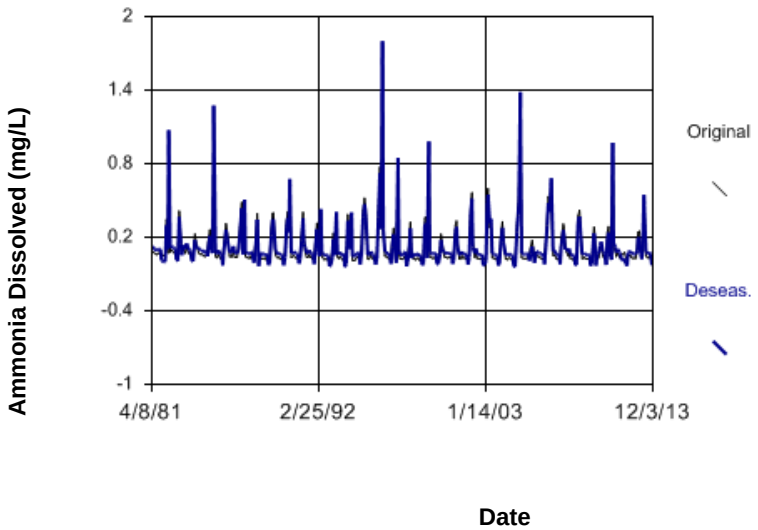


Figure B2 Battle River: Ammonia Dissolved

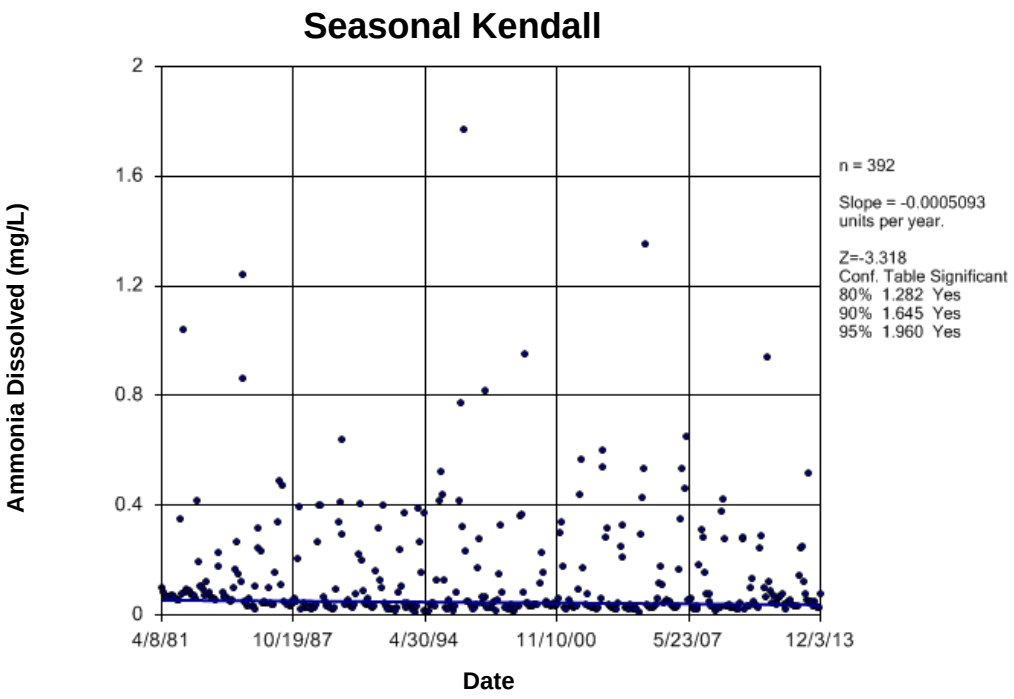


Figure B3 Battle River: Ammonia Dissolved

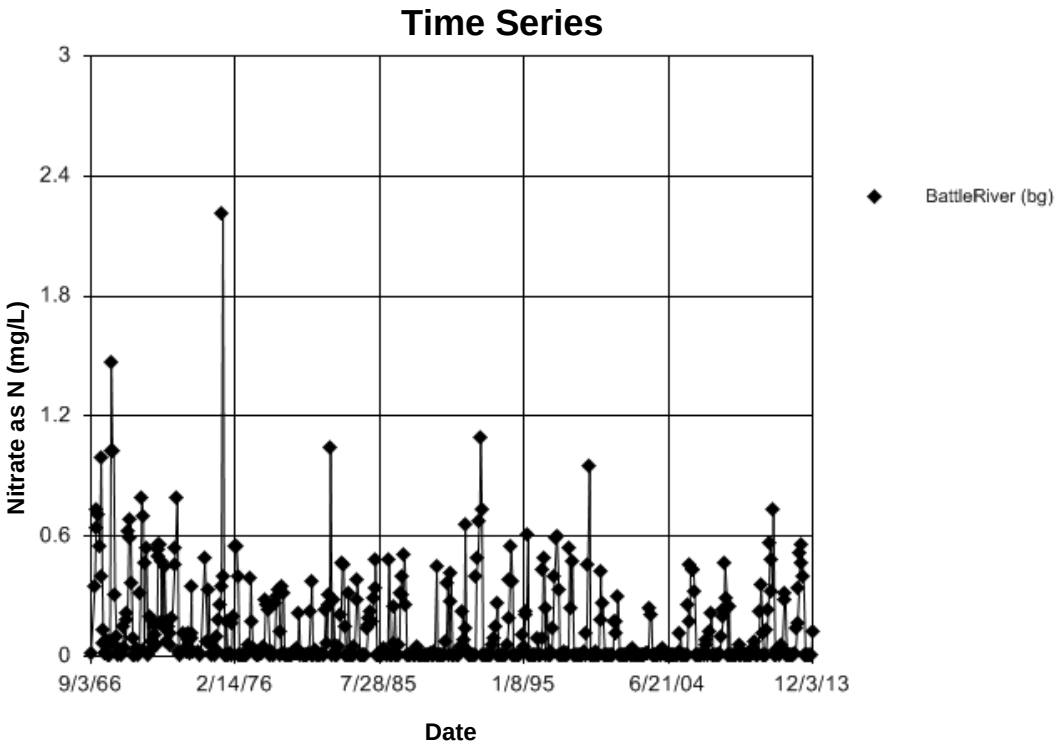


Figure B4 Battle River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 113.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 43 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 113.7
Adjusted Kruskal-Wallis statistic (H') = 113.7

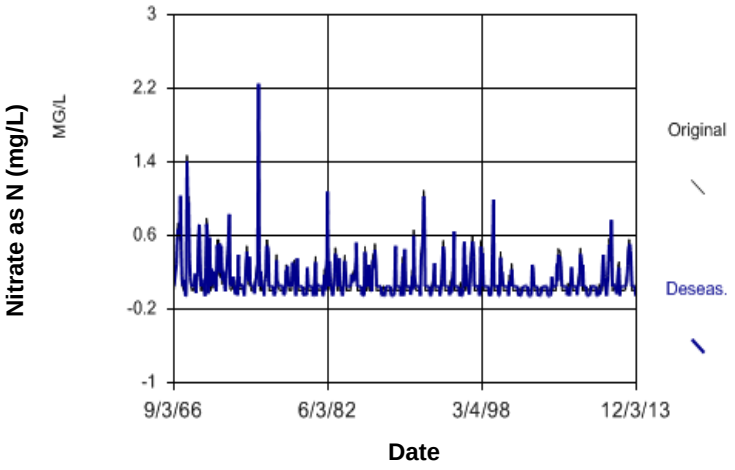


Figure B5 Battle River: Nitrate as N

Seasonal Kendall

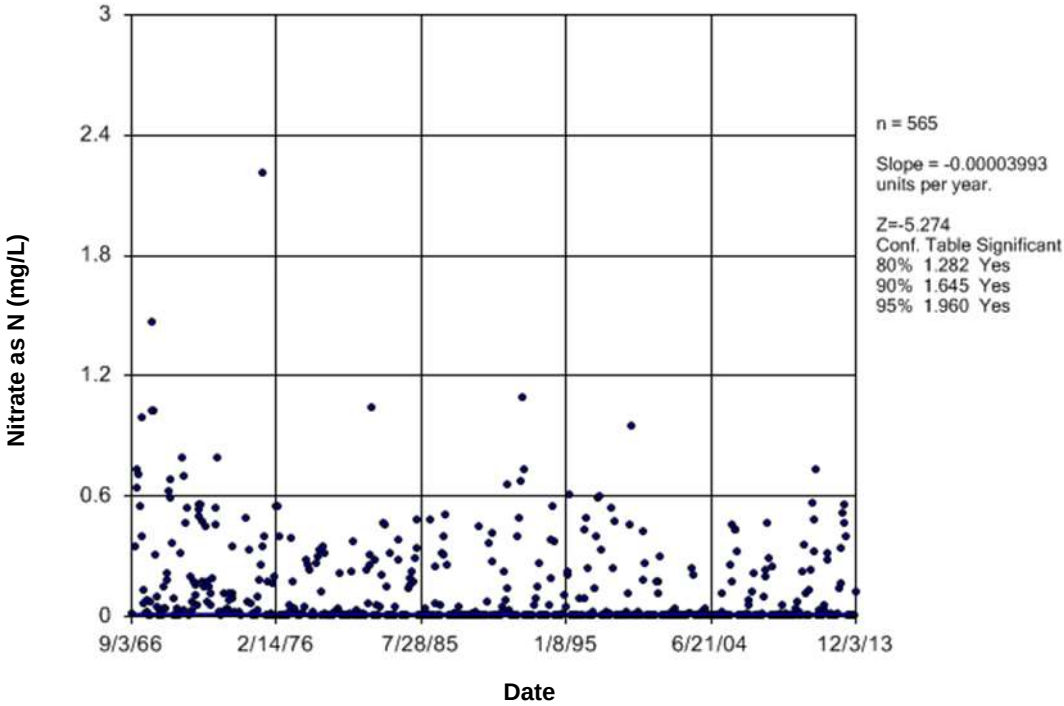


Figure B6 Battle River: Nitrate as N

Time Series

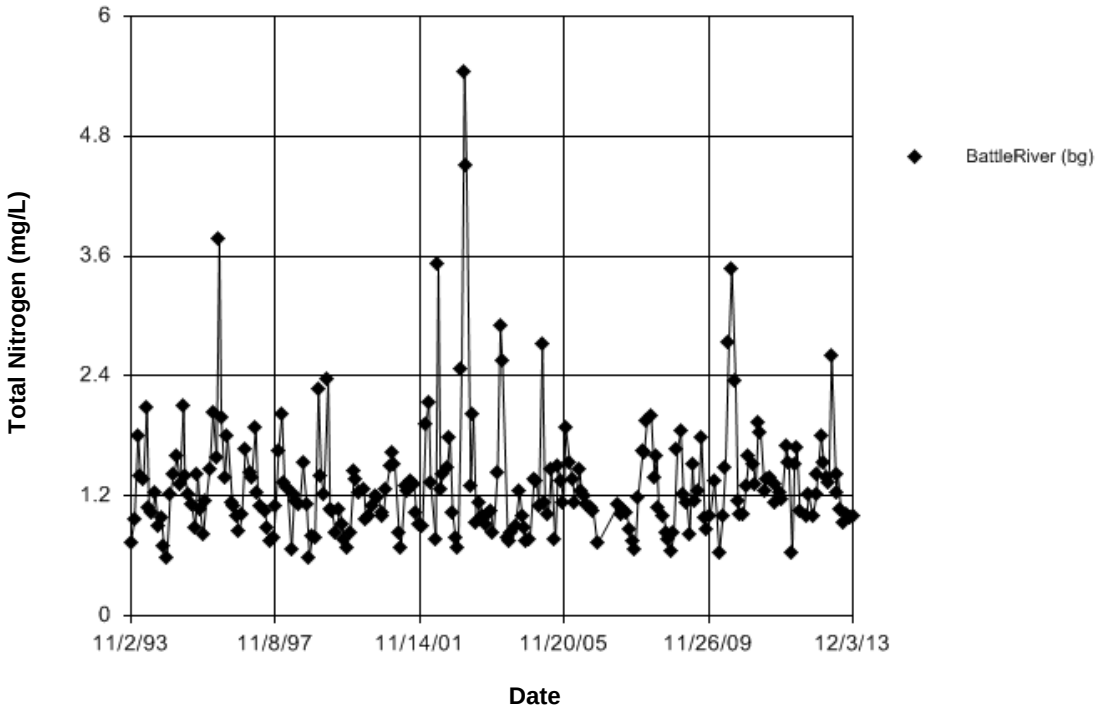


Figure B7 Battle River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.302
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 11 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.302
Adjusted Kruskal-Wallis statistic (H') = 4.302

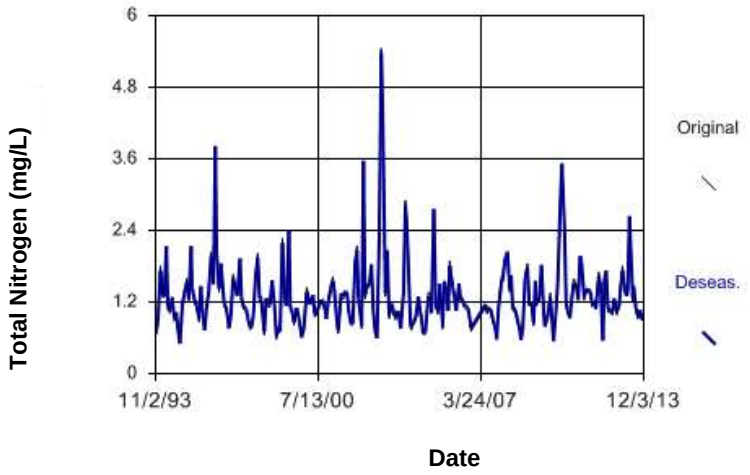


Figure B8 Battle River: Total Nitrogen

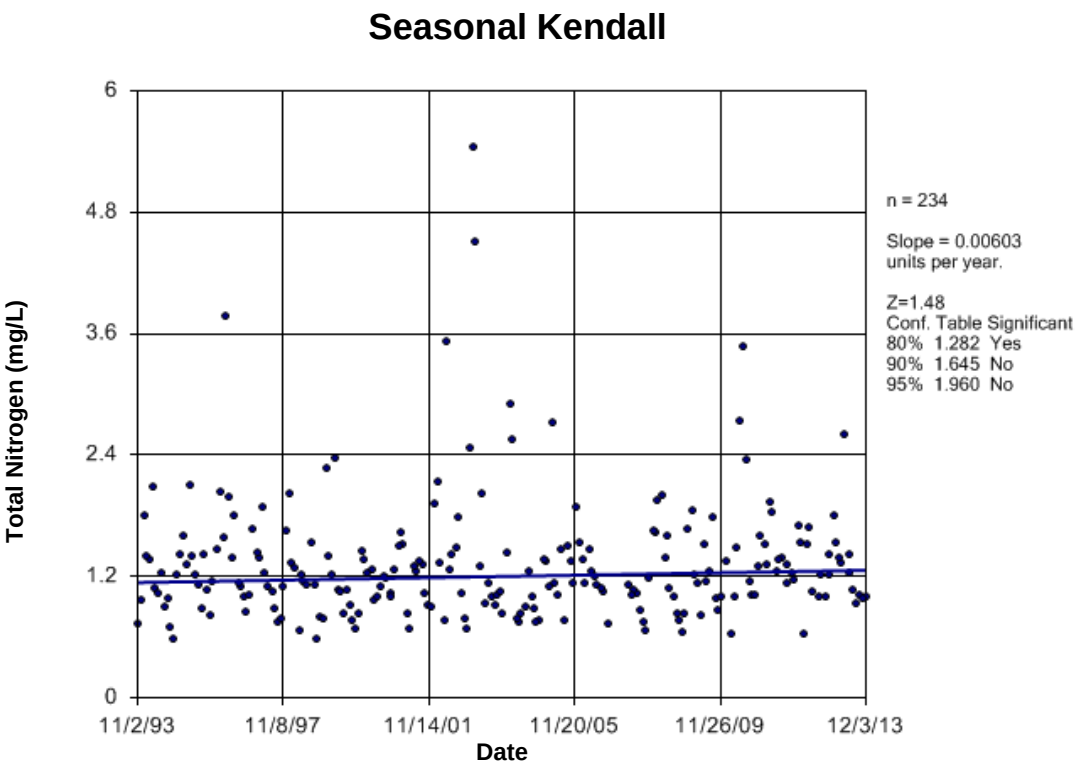


Figure B9 Battle River: Total Nitrogen

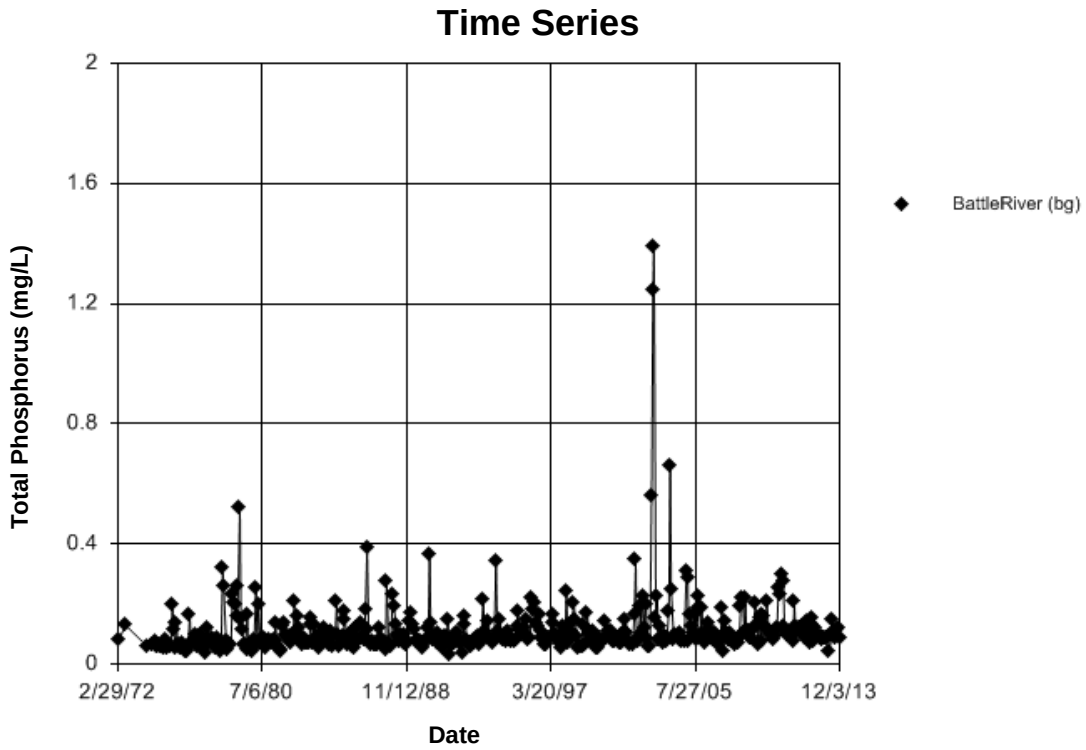


Figure B10 Battle River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 11.52
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 23 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 11.52
Adjusted Kruskal-Wallis statistic (H') = 11.52

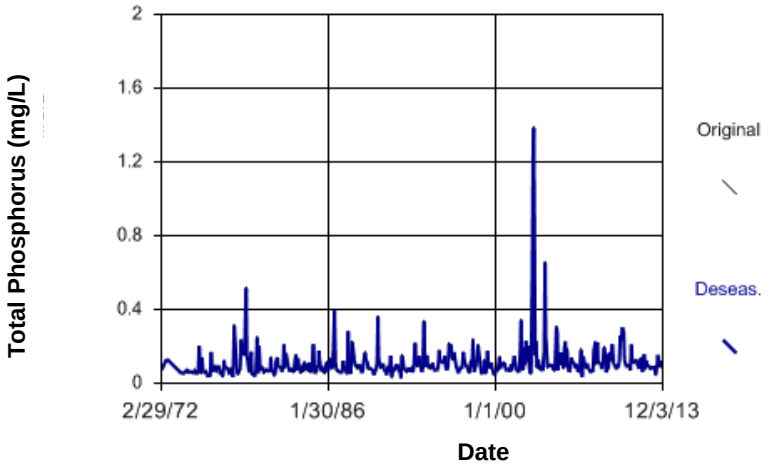


Figure B11 Battle River: Total Phosphorus

Seasonal Kendall

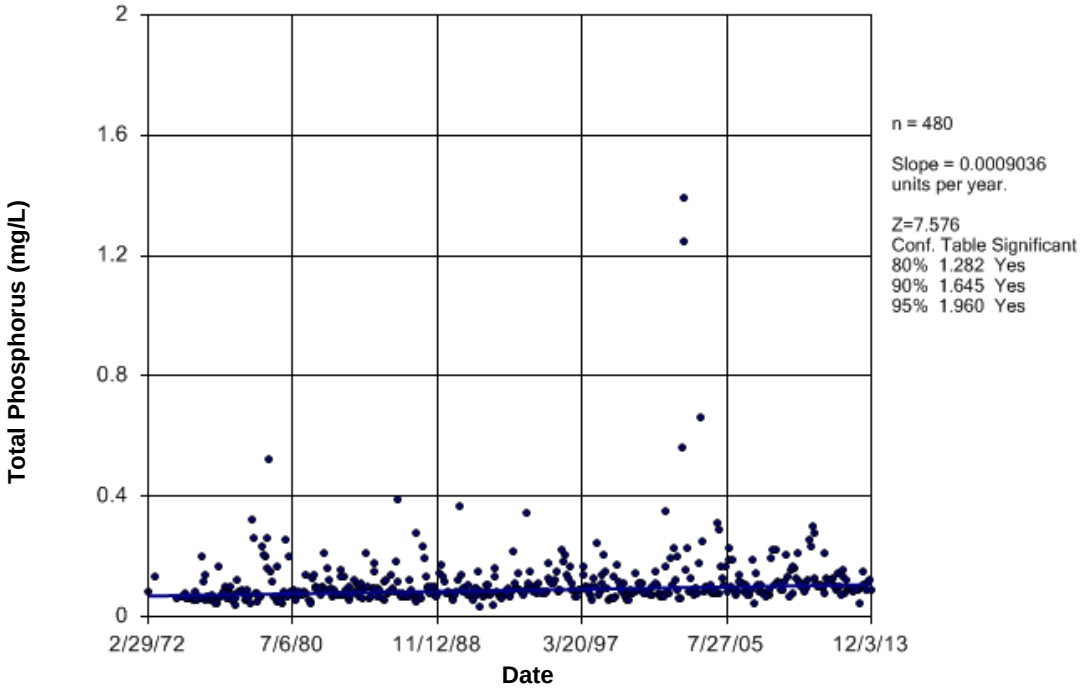


Figure B12 Battle River: Total Phosphorus

Time Series

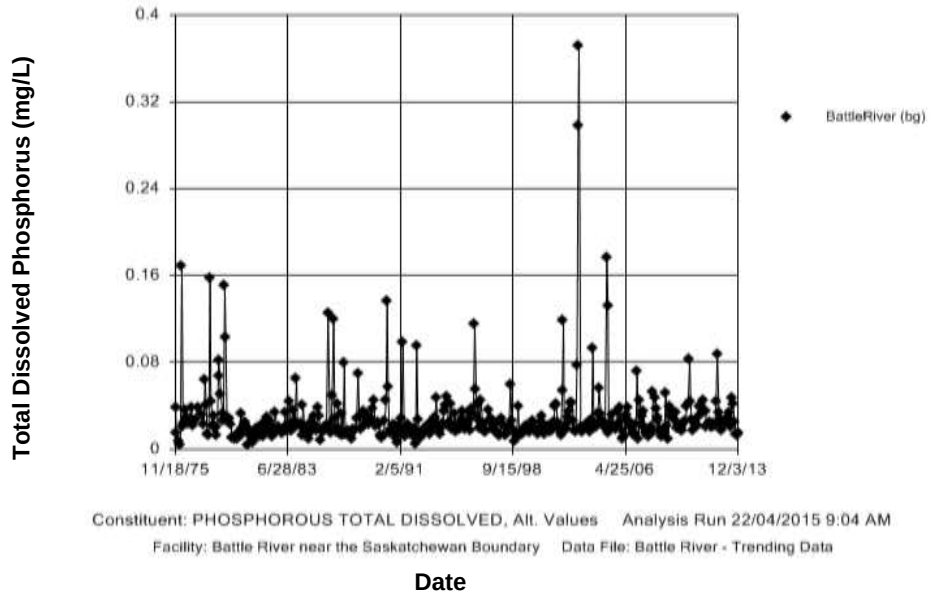


Figure B13 Battle River: Total Dissolved Phosphorus

Seasonality

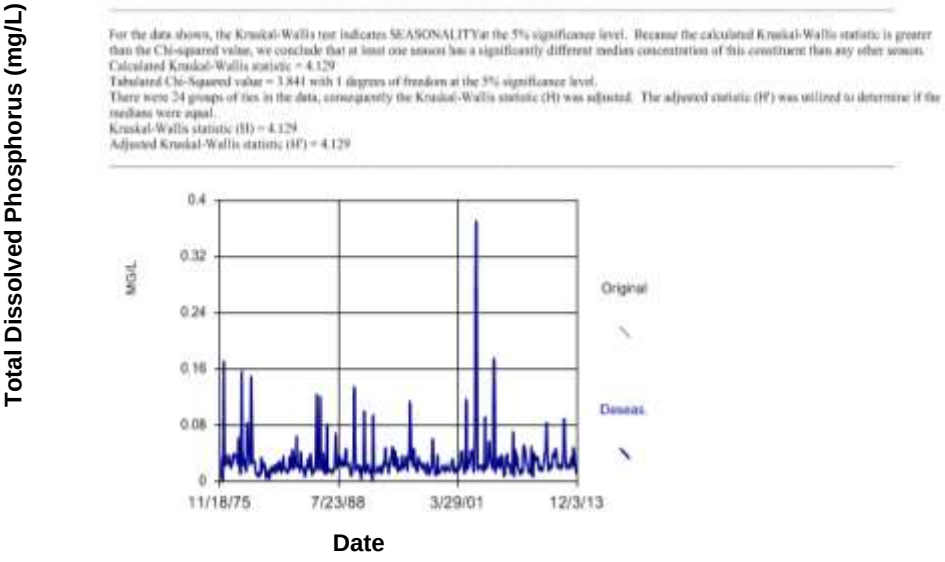


Figure B14 Battle River: Total Dissolved Phosphorus

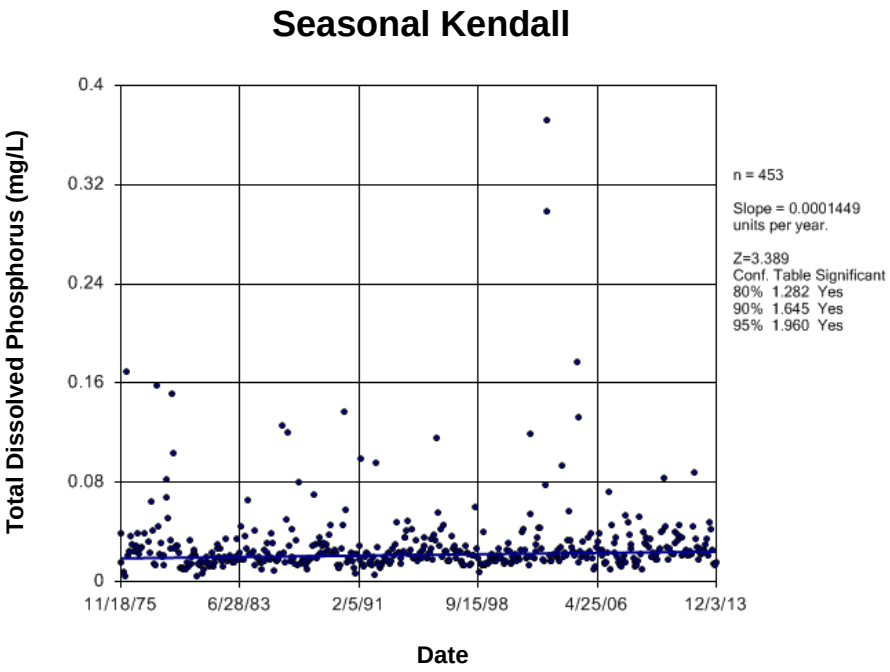


Figure B15 Battle River: Total Dissolved Phosphorus

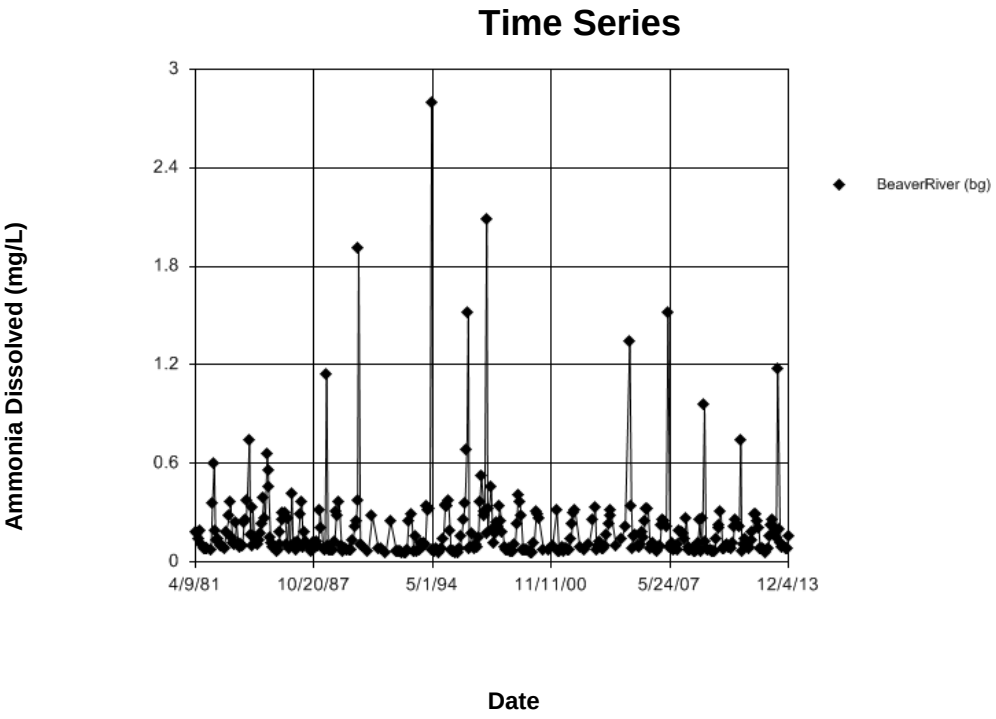
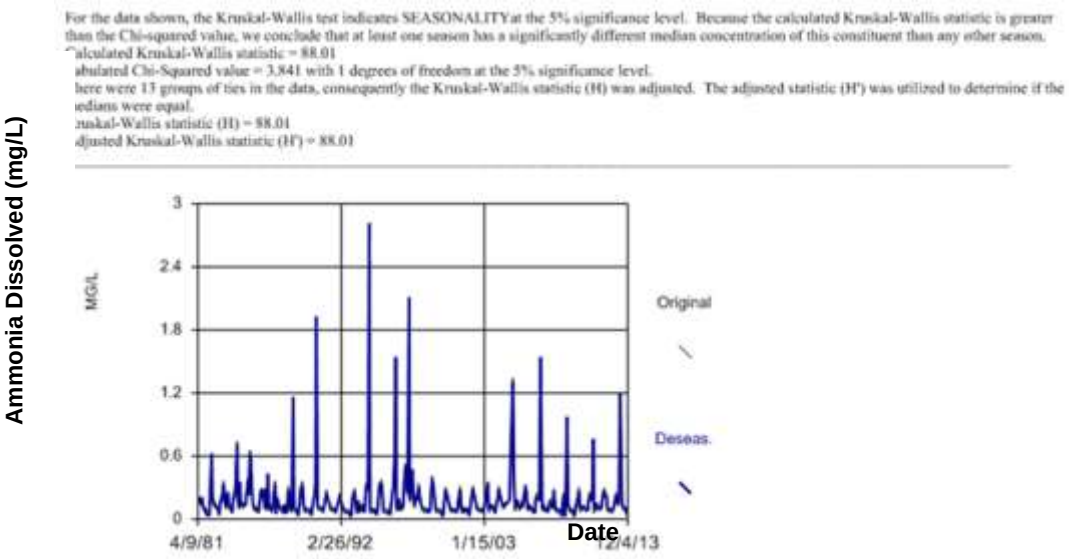


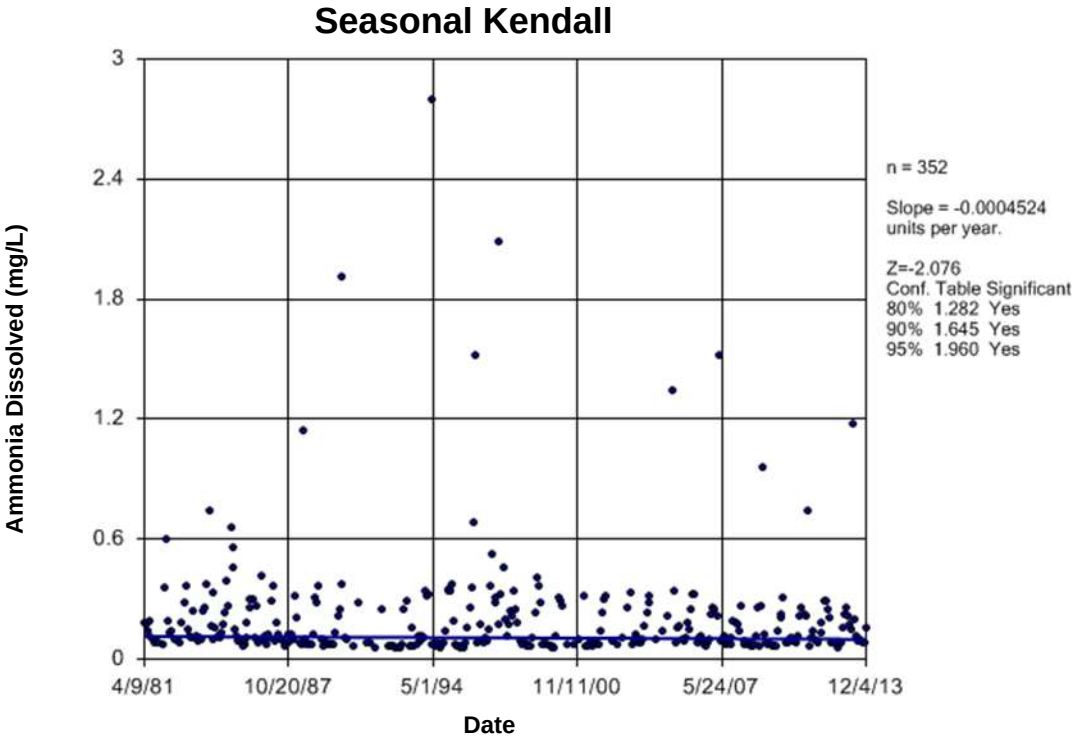
Figure B16 Beaver River: Ammonia Dissolved

Seasonality



Ammonia Dissolved (mg/L)

Figure B17 Beaver River: Ammonia Dissolved



Ammonia Dissolved (mg/L)

Figure B18 Beaver River: Ammonia Dissolved

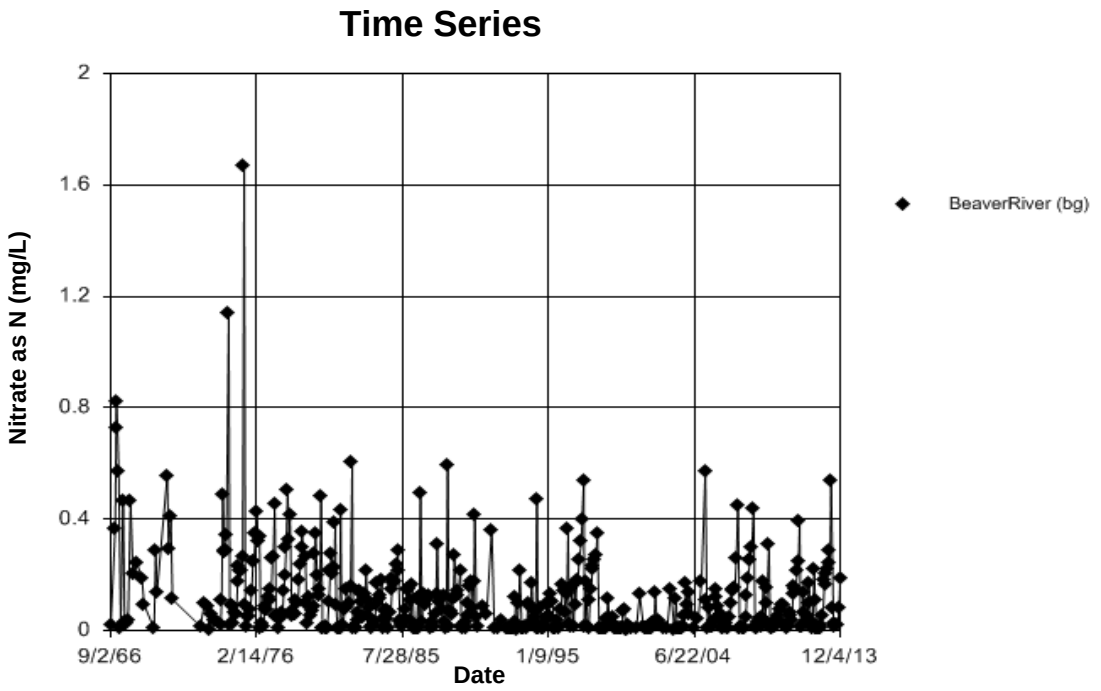


Figure B19 Beaver River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 120.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 120.7
Adjusted Kruskal-Wallis statistic (H') = 120.7

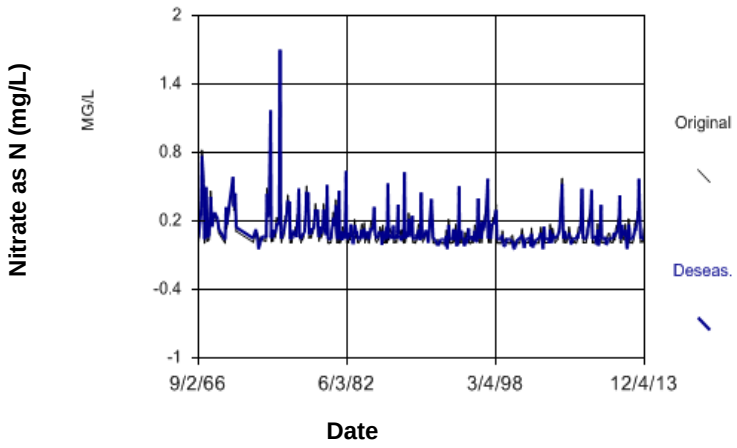


Figure B20 Beaver River: Nitrate as N

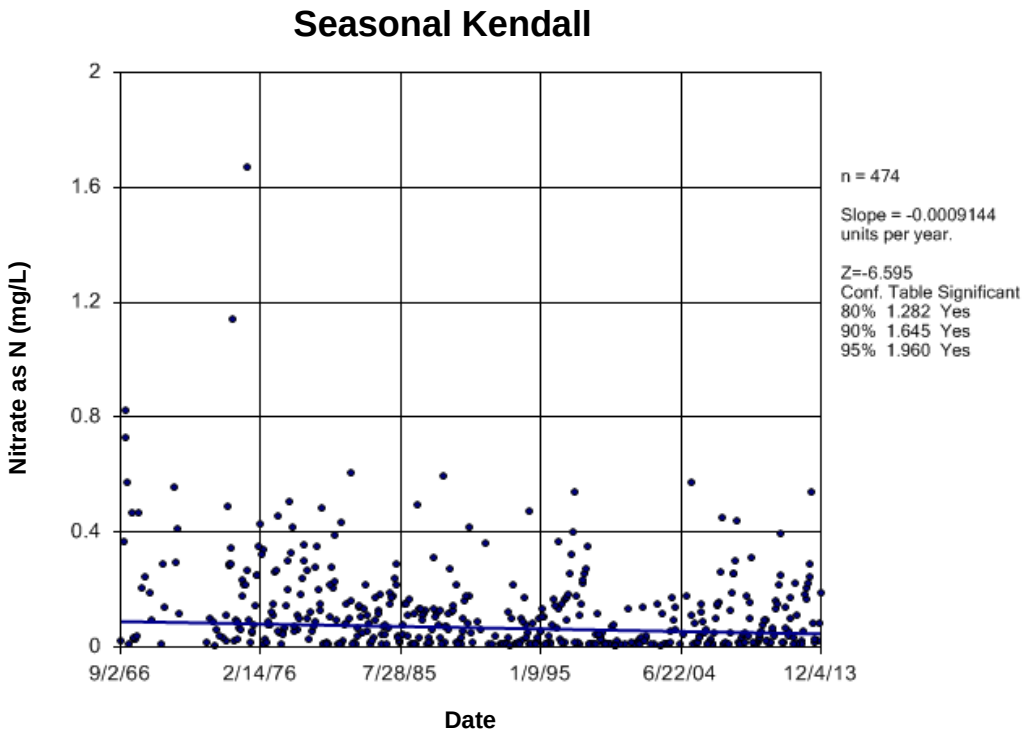


Figure B21 Beaver River: Nitrate as N

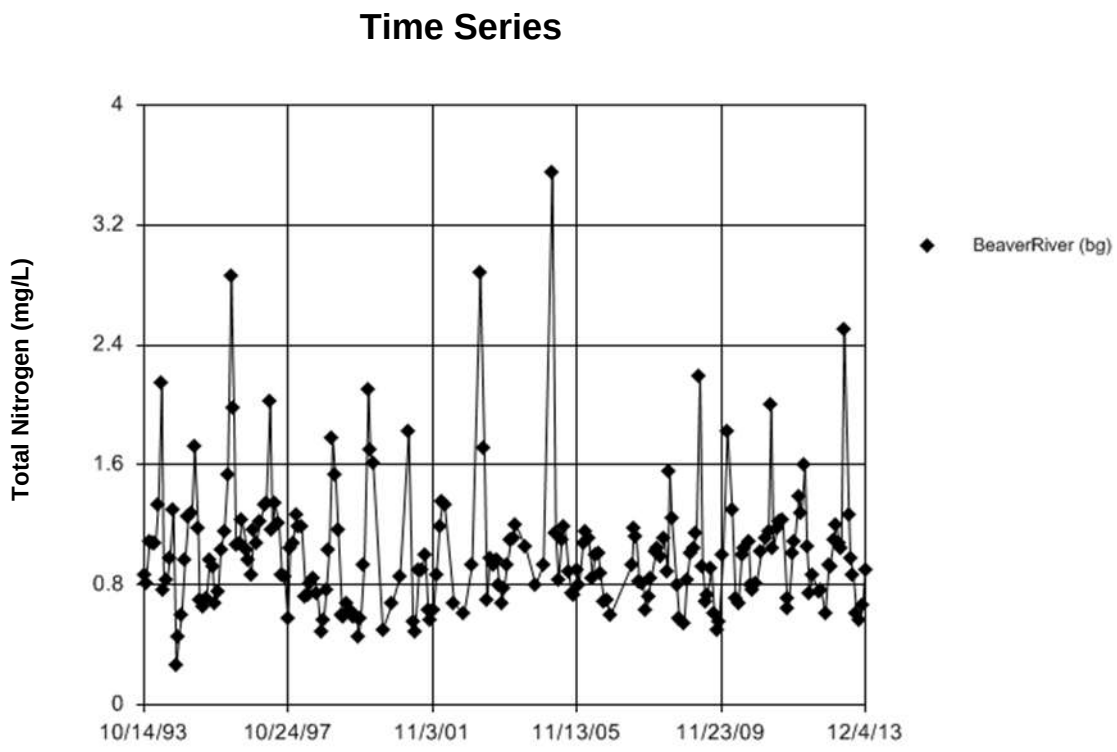


Figure B22 Beaver River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 32.36
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 32.36
Adjusted Kruskal-Wallis statistic (H') = 32.36

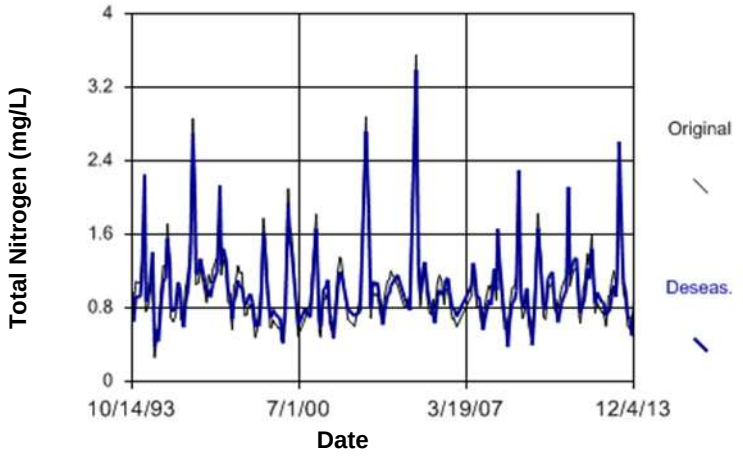


Figure B23 Beaver River: Total Nitrogen

Seasonal Kendall

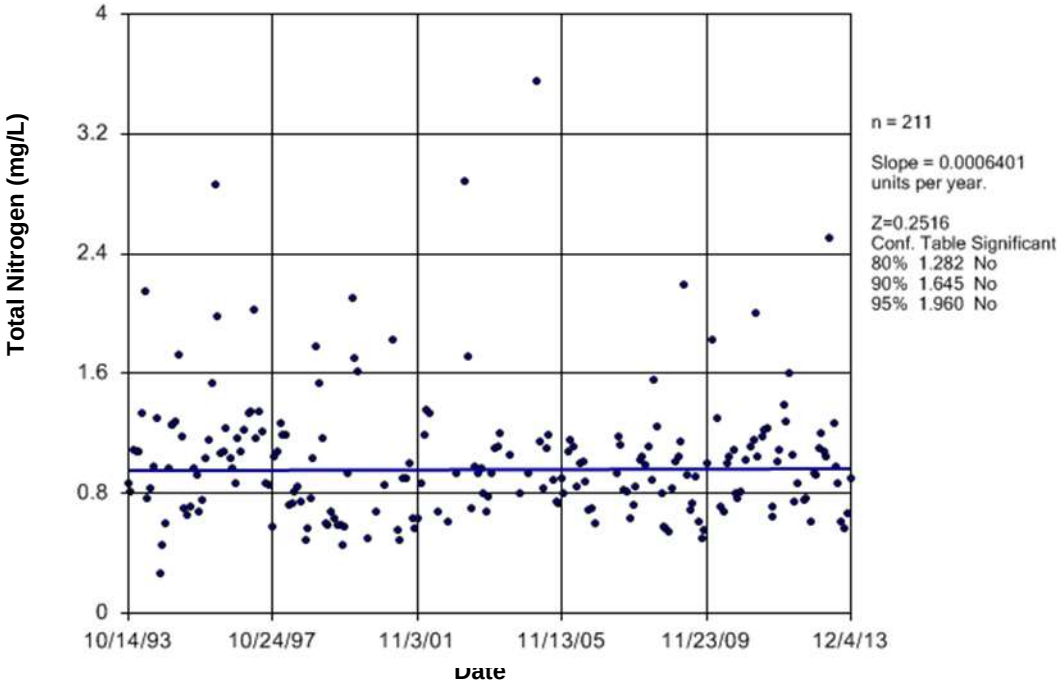


Figure B24 Beaver River: Total Nitrogen

Time Series

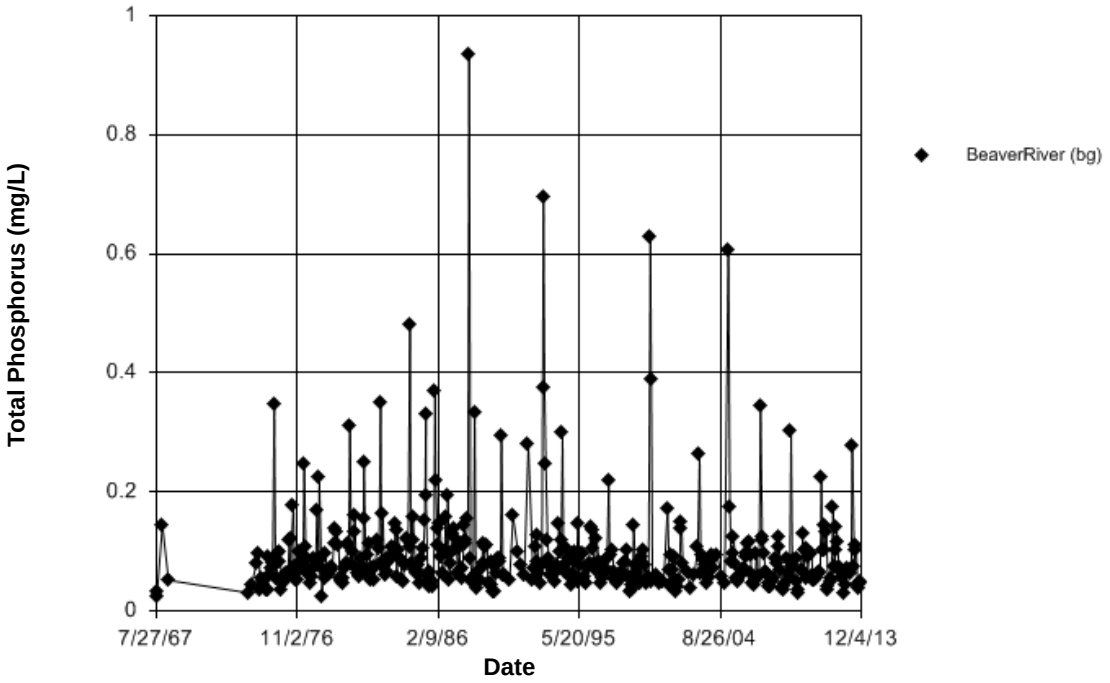


Figure B25 Beaver River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7781
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 14 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7781
Adjusted Kruskal-Wallis statistic (H') = 0.7781

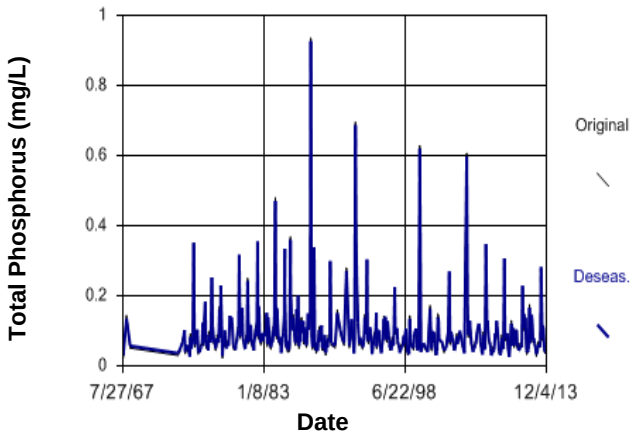


Figure B26 Beaver River: Total Phosphorus

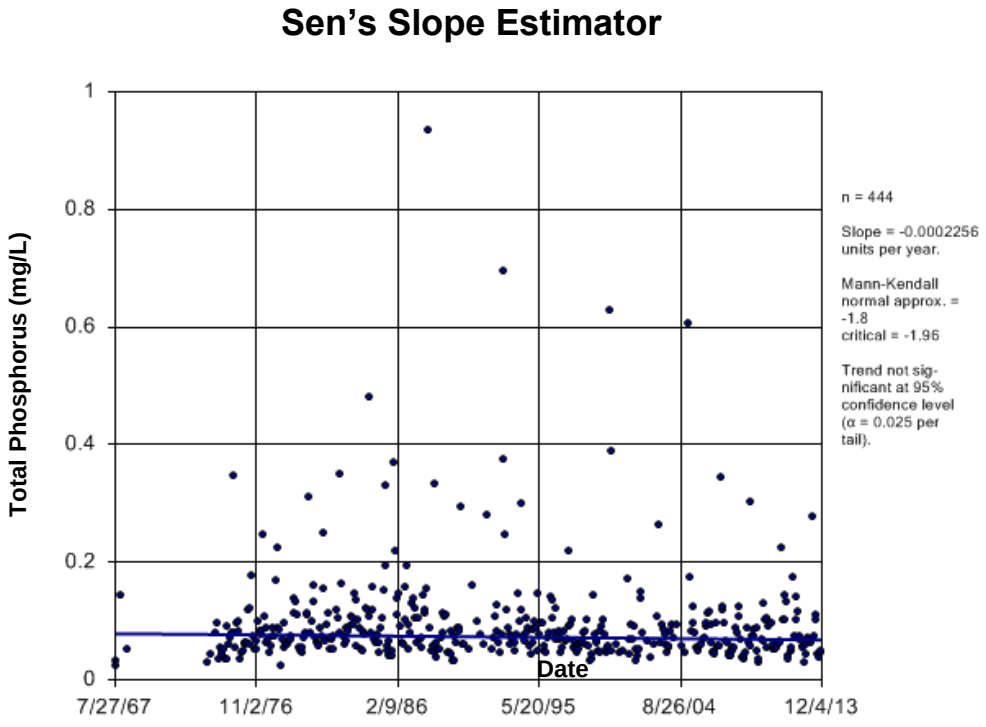


Figure B27 Beaver River: Total Phosphorus

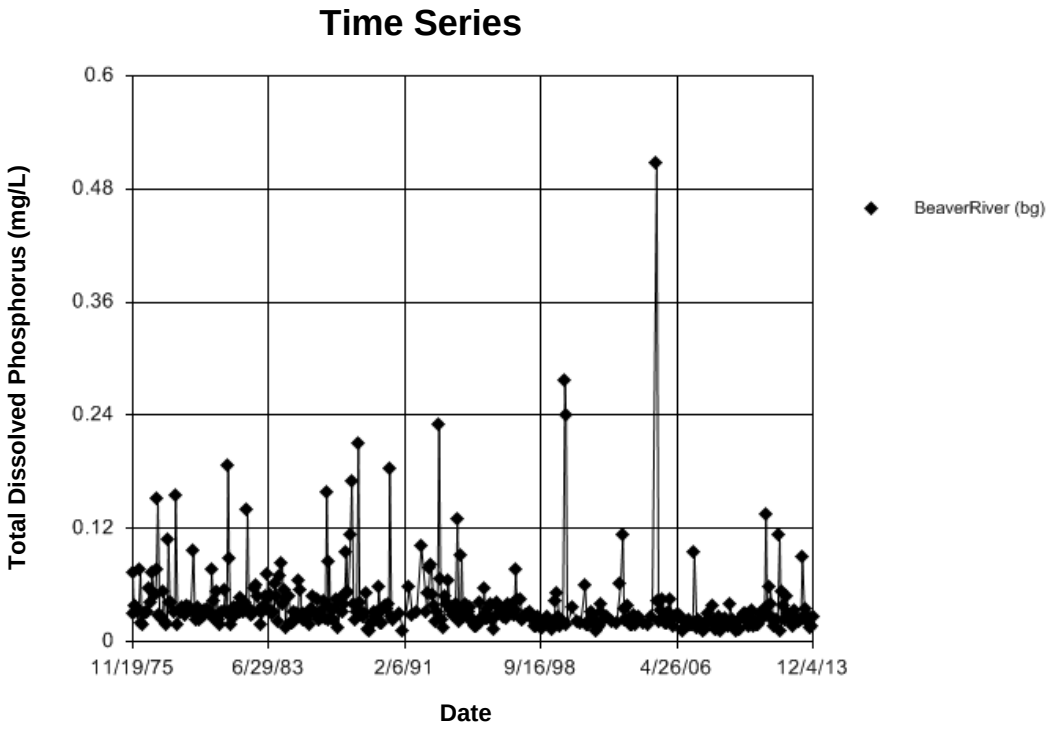


Figure B28 Beaver River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7073
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 17 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7073
Adjusted Kruskal-Wallis statistic (H') = 0.7073

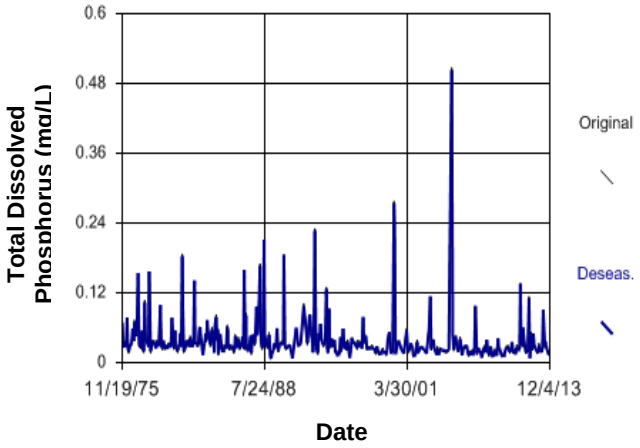


Figure B29 Beaver River: Total Dissolved Phosphorus

Sen's Slope Estimator

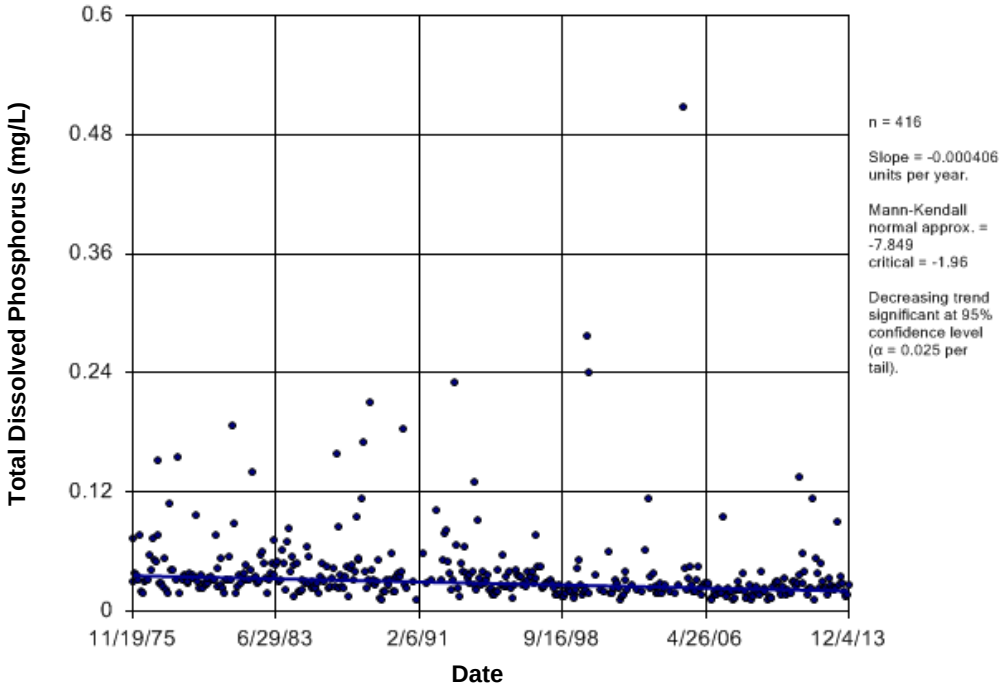


Figure B30 Beaver River: Total Dissolved Phosphorus

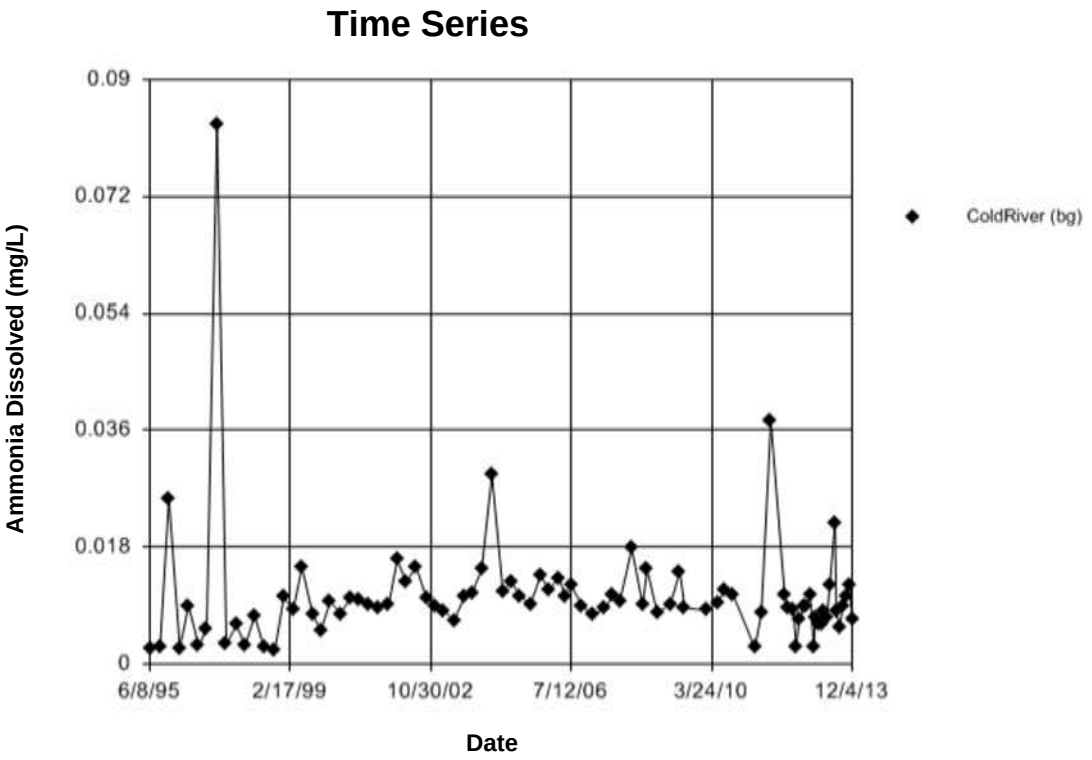


Figure B31 Cold River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1385
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

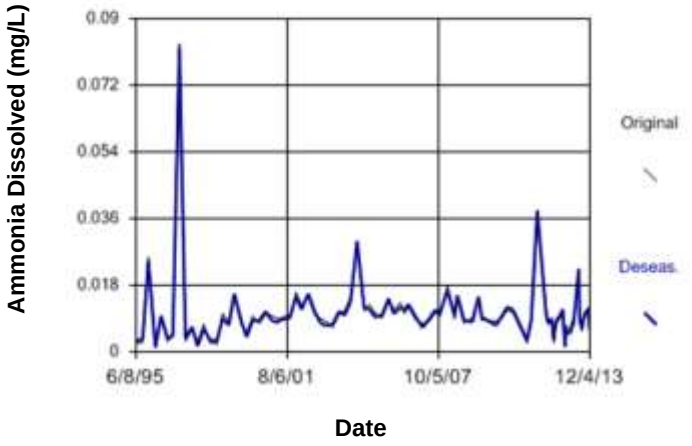


Figure B32 Cold River: Ammonia Dissolved

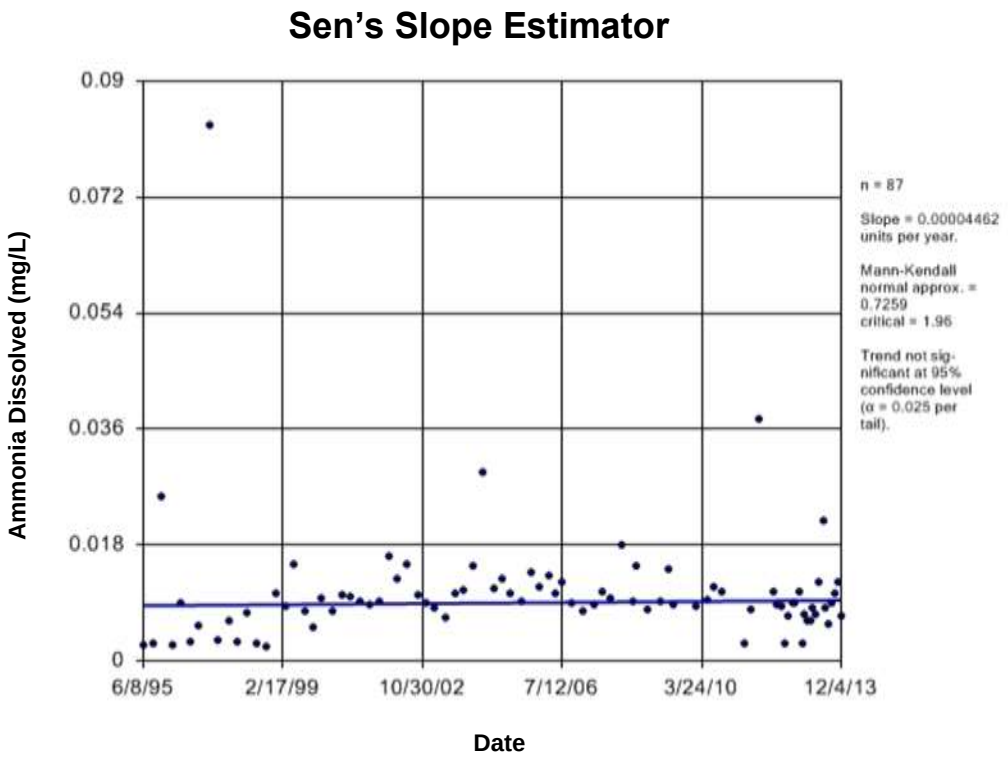


Figure B33 Cold River: Ammonia Dissolved

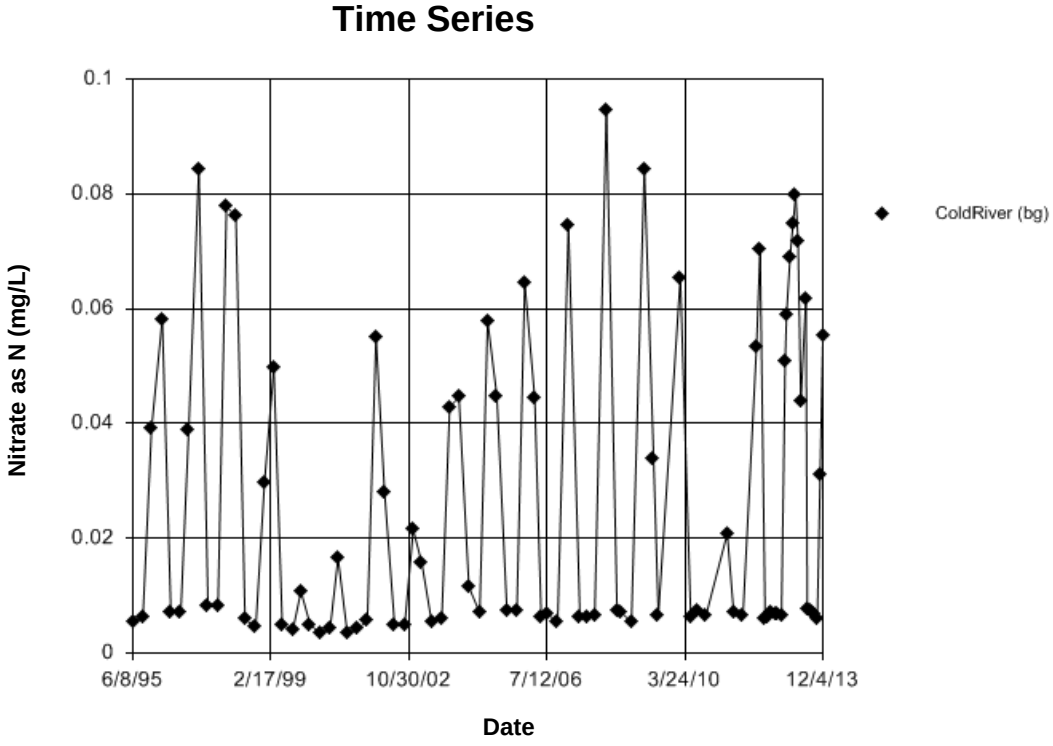


Figure B34 Cold River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 41.59
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 41.59
Adjusted Kruskal-Wallis statistic (H') = 41.59

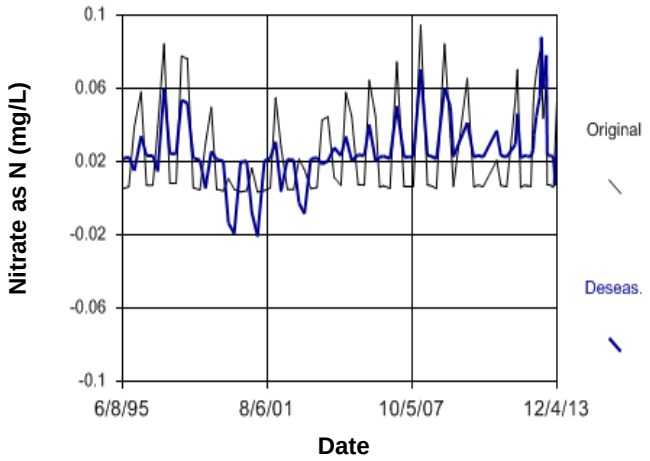


Figure B35 Cold River: Nitrate as N

Seasonal Kendall

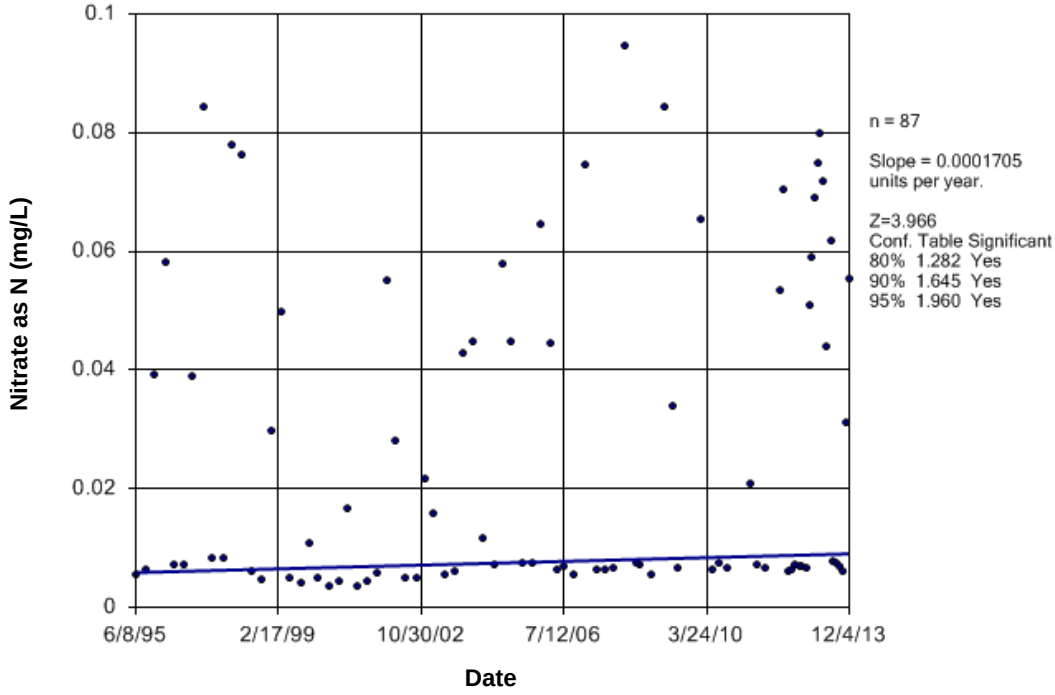


Figure B36 Cold River: Nitrate as N

Time Series

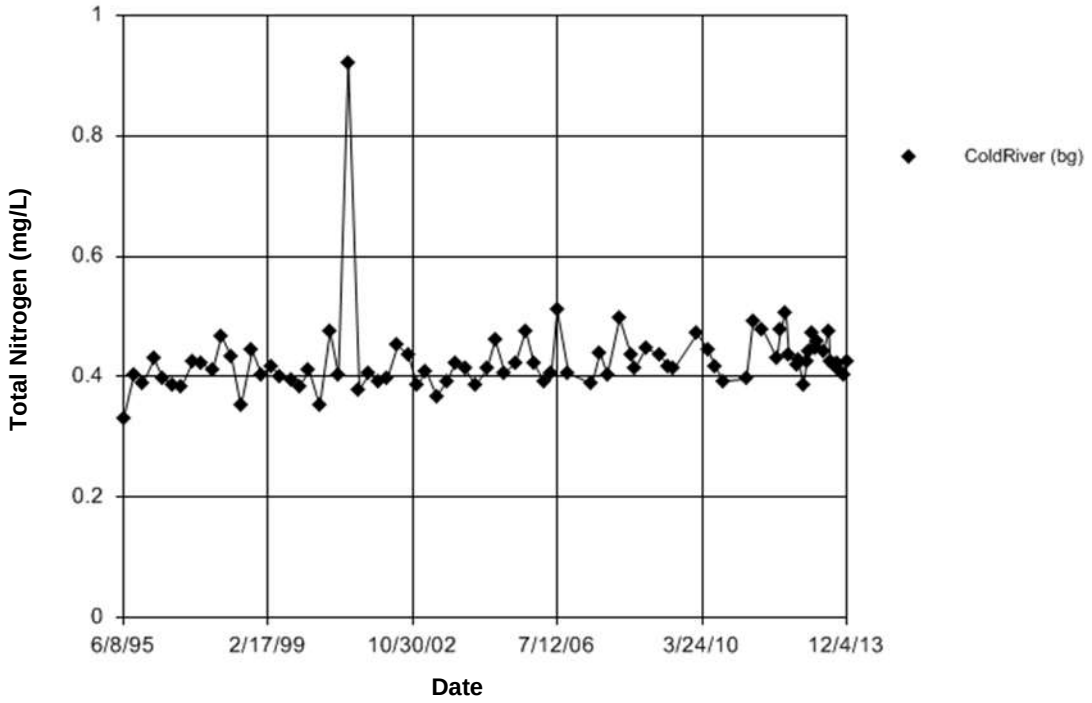


Figure B37 Cold River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7976
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7976
Adjusted Kruskal-Wallis statistic (H') = 0.7976

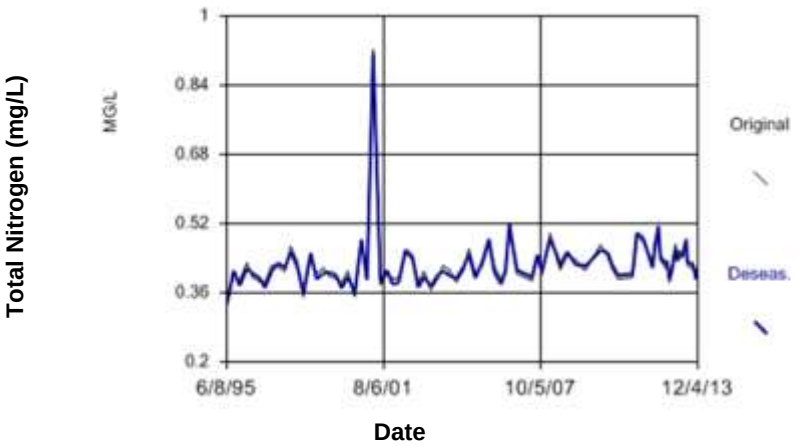


Figure B38 Cold River: Total Nitrogen

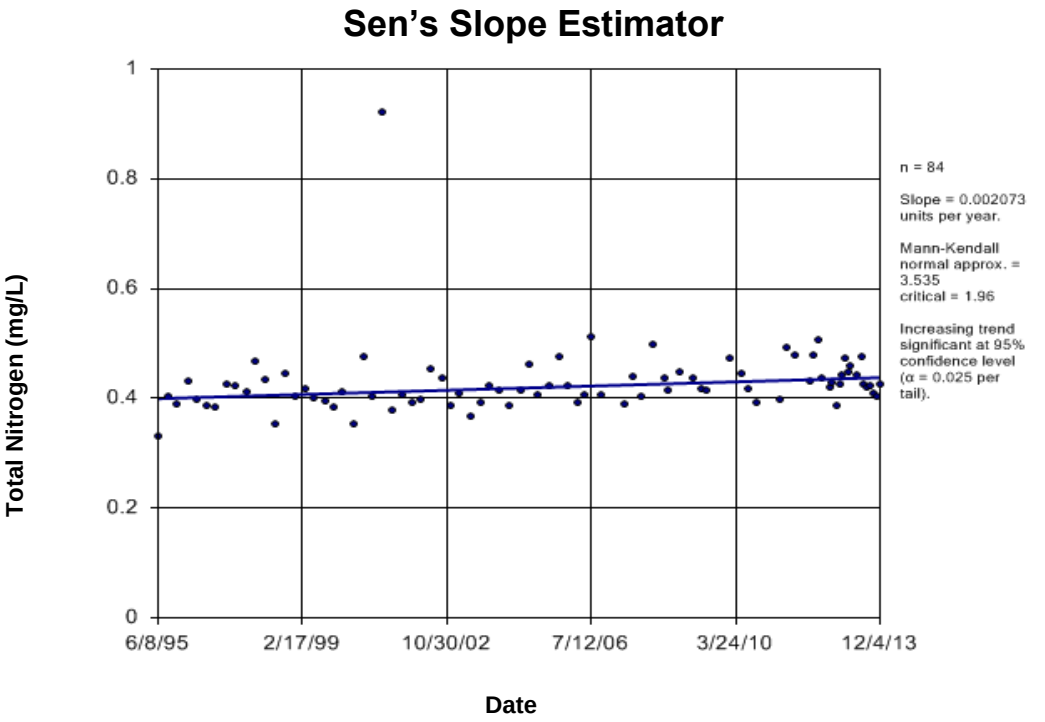


Figure B39 Cold River: Total Nitrogen

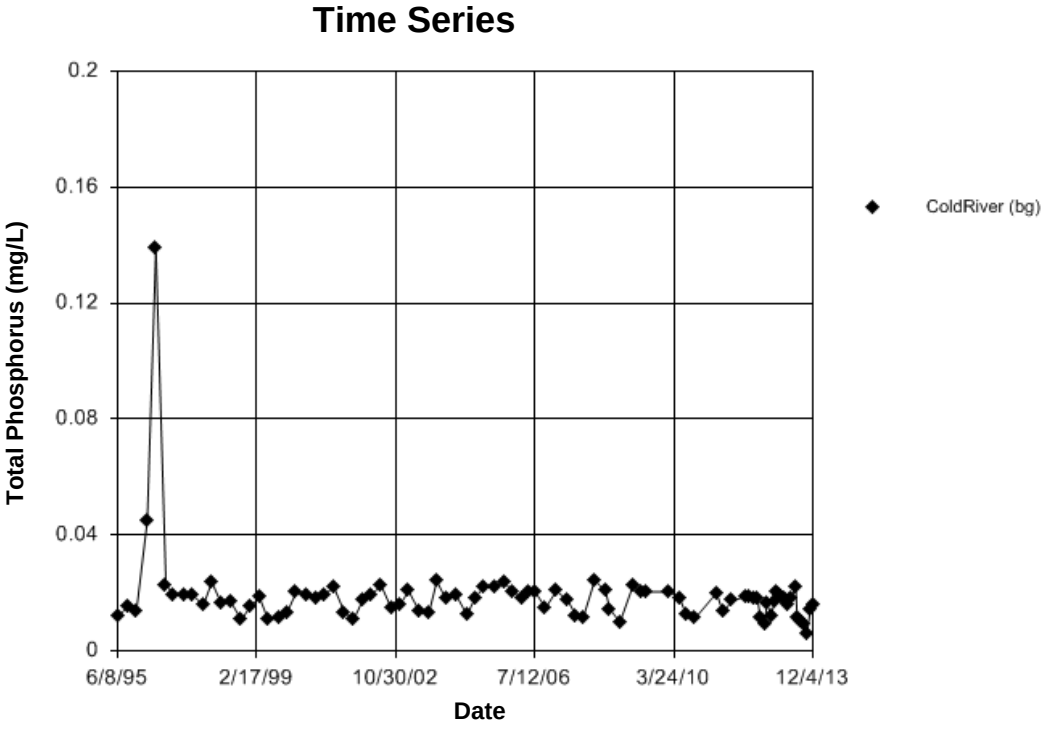


Figure B40 Cold River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 12.2
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 12.2
Adjusted Kruskal-Wallis statistic (H') = 12.2

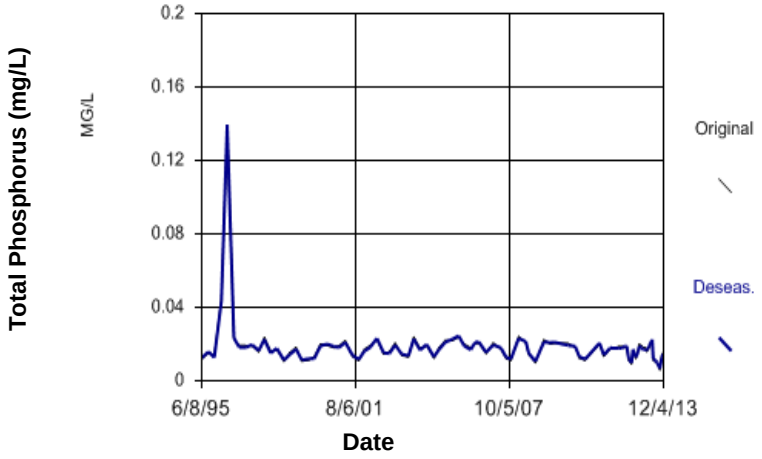


Figure B41 Cold River: Total Phosphorus

Seasonal Kendall

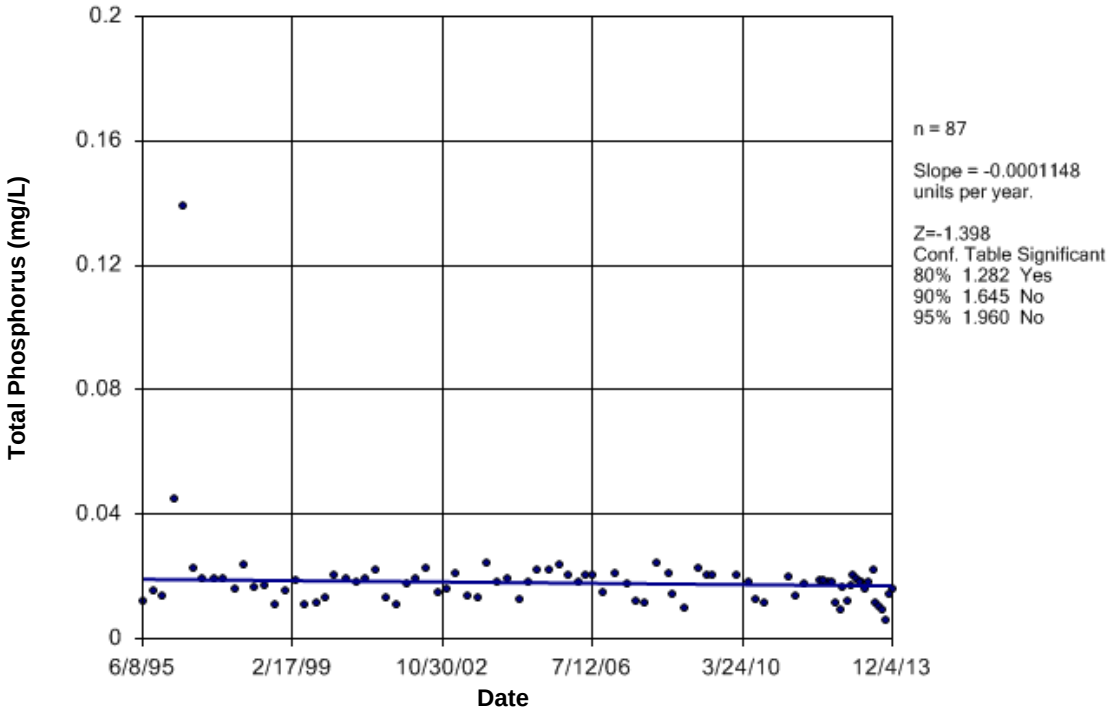


Figure B42 Cold River: Total Phosphorus

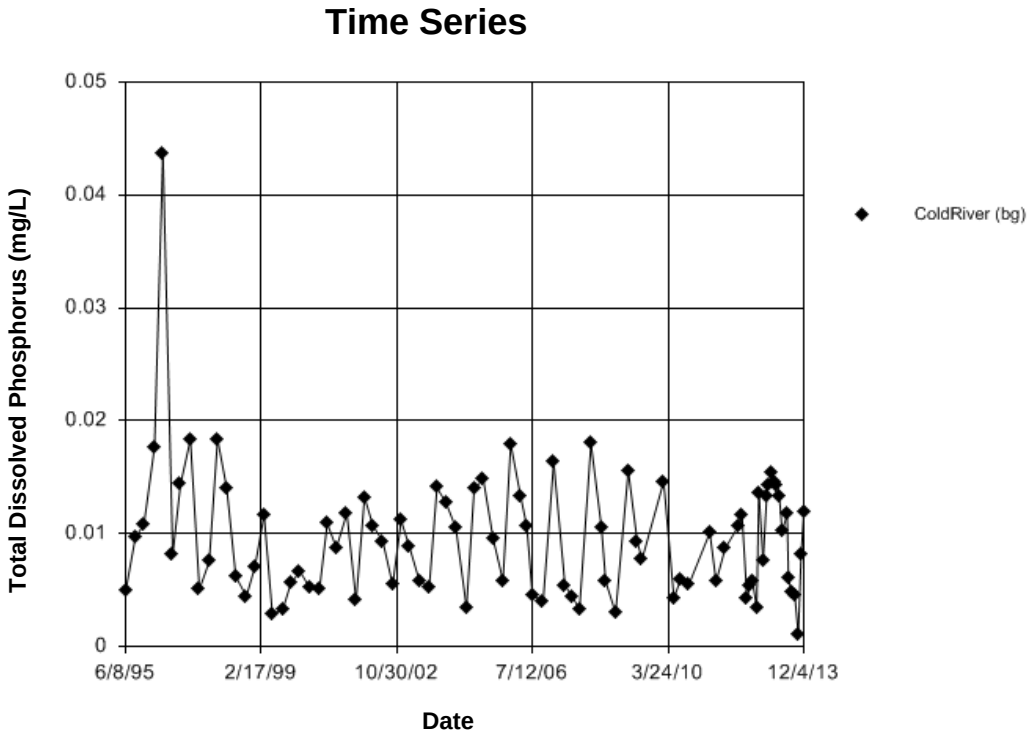


Figure B43 Cold River: Total Dissolved Phosphorus

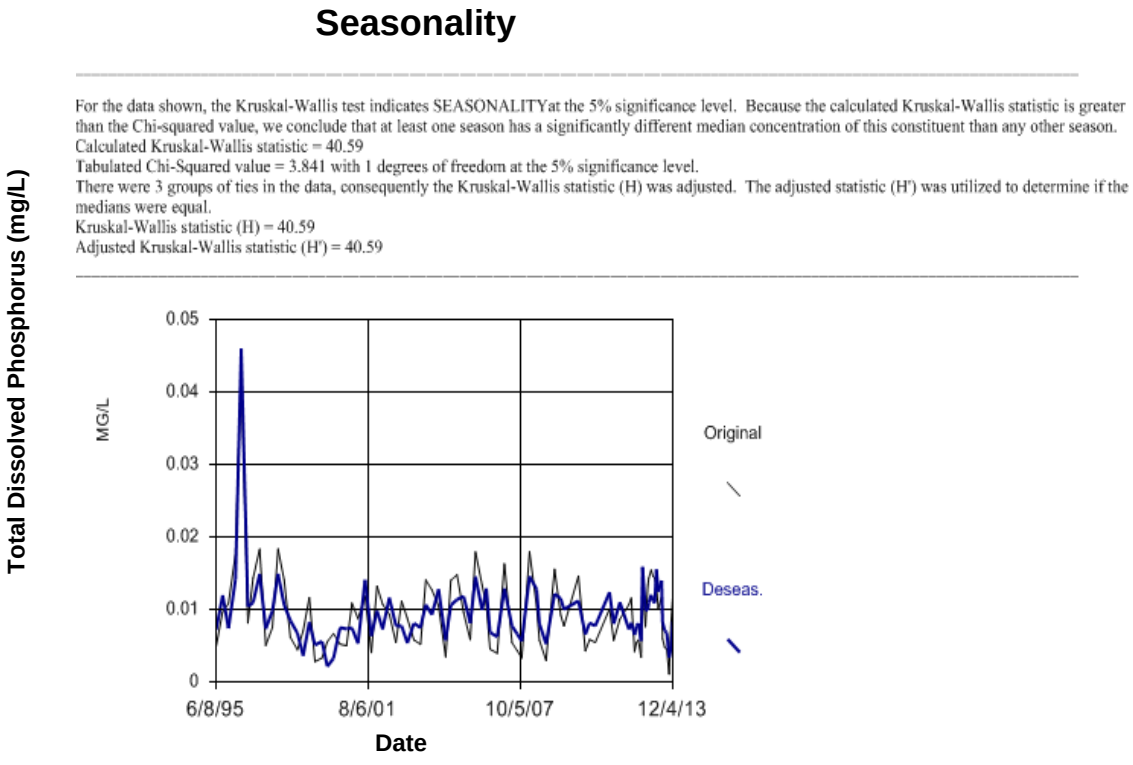


Figure B44 Cold River: Total Dissolved Phosphorus

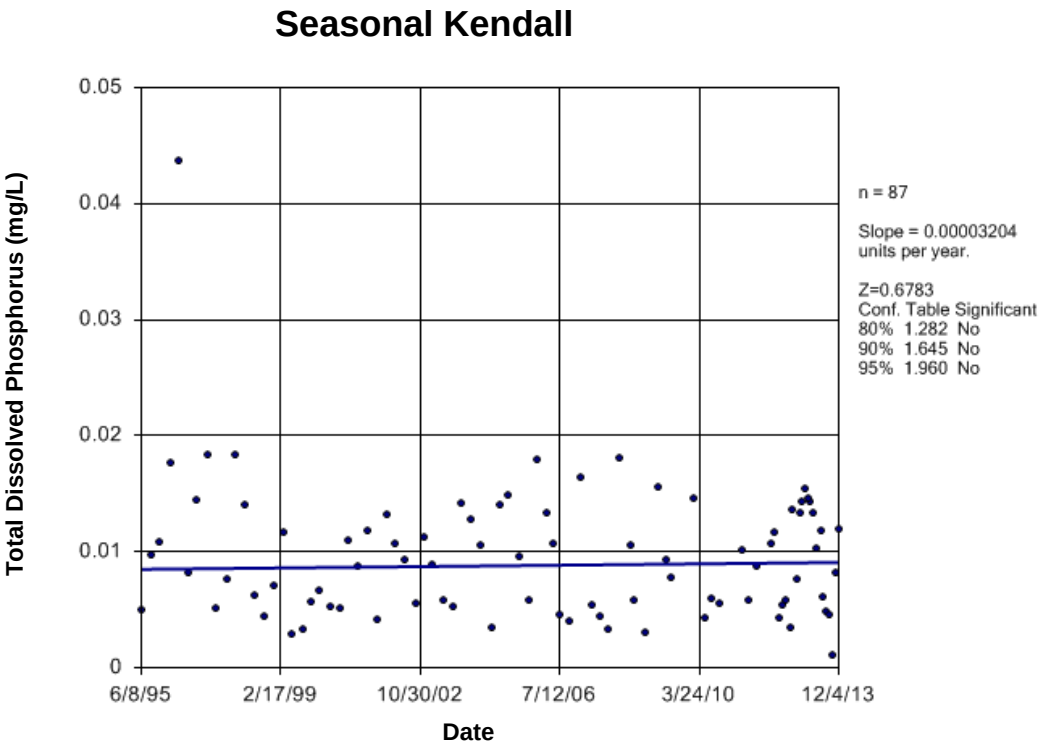


Figure B45 Cold River: Total Dissolved Phosphorus

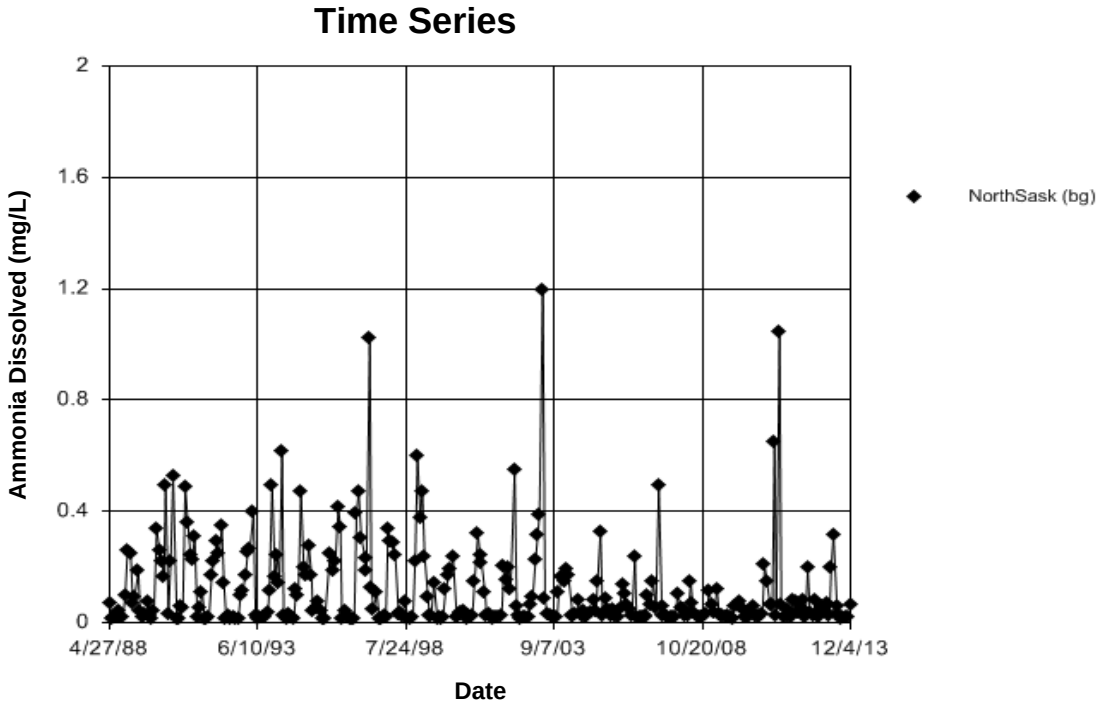


Figure B46 North Saskatchewan River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 81.73
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 81.73
Adjusted Kruskal-Wallis statistic (H') = 81.73

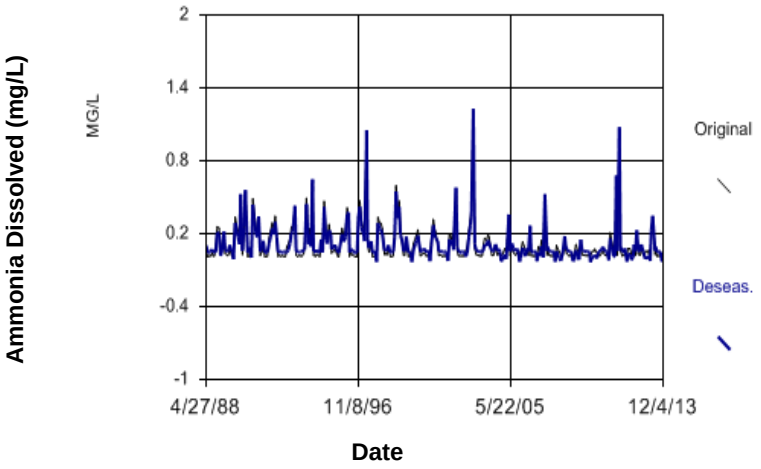


Figure B47 North Saskatchewan River: Ammonia Dissolved

Seasonal Kendall

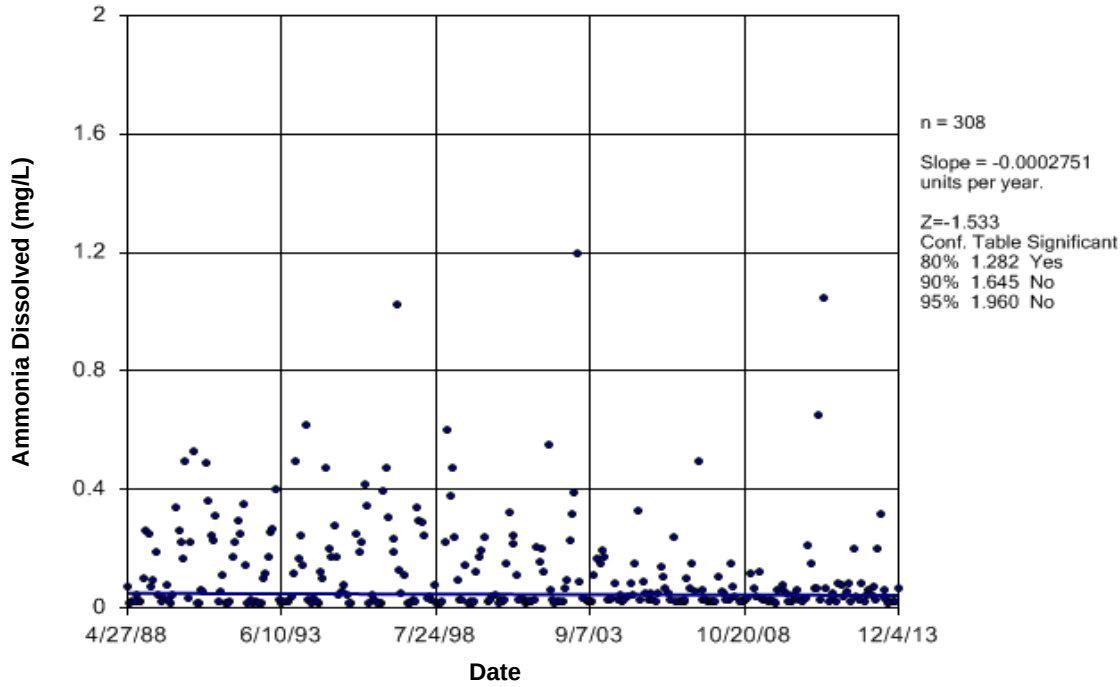


Figure B48 North Saskatchewan River: Ammonia Dissolved

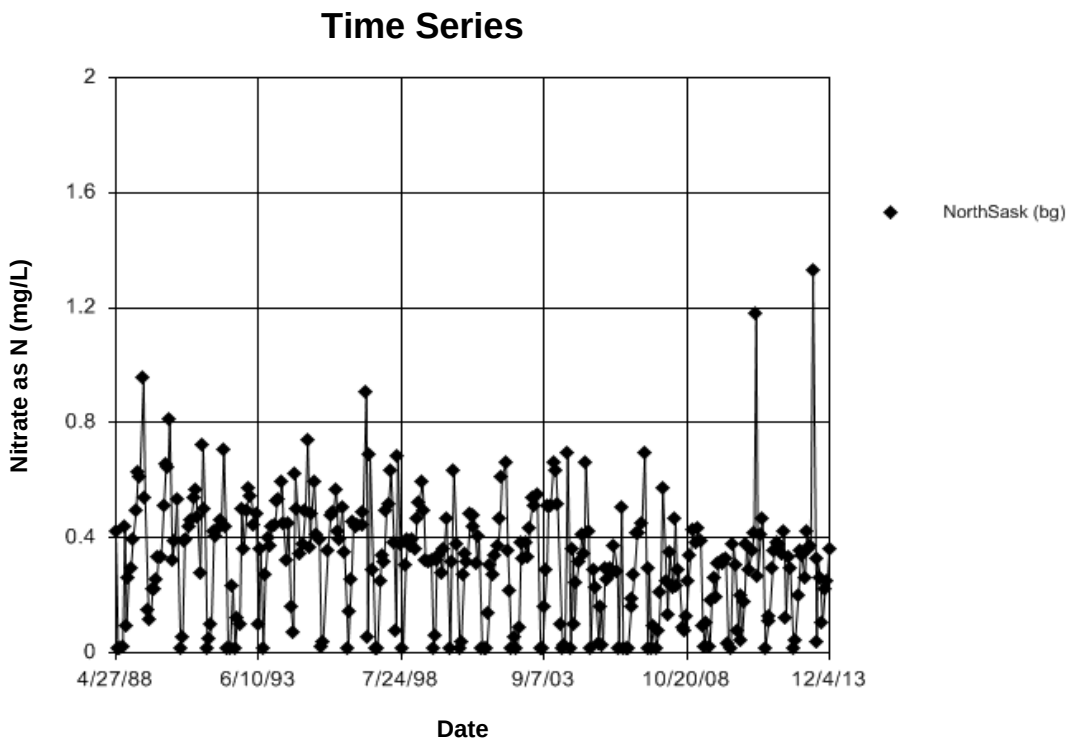


Figure B49 North Saskatchewan River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 54.89
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 11 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 54.89
Adjusted Kruskal-Wallis statistic (H') = 54.89

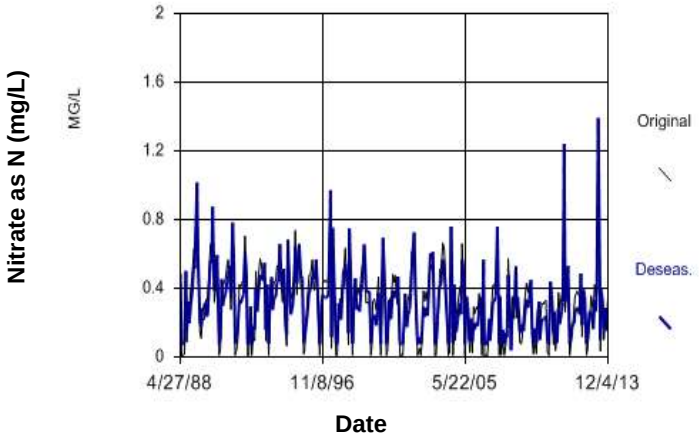


Figure B50 North Saskatchewan River: Nitrate as N

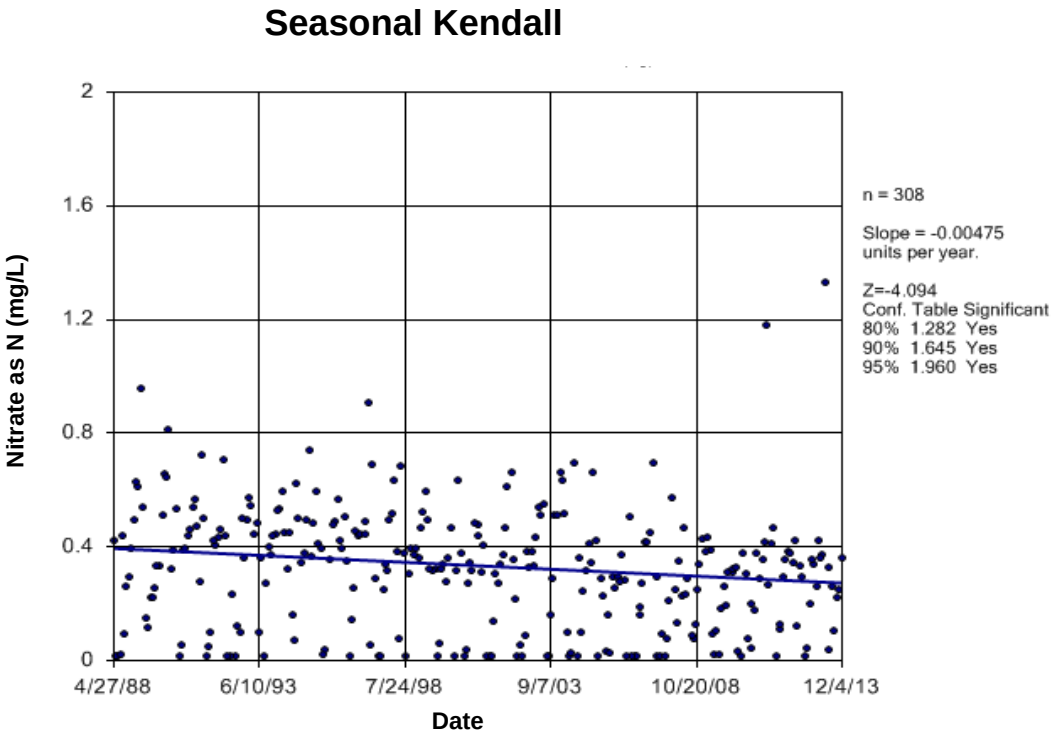


Figure B51 North Saskatchewan River: Nitrate as N

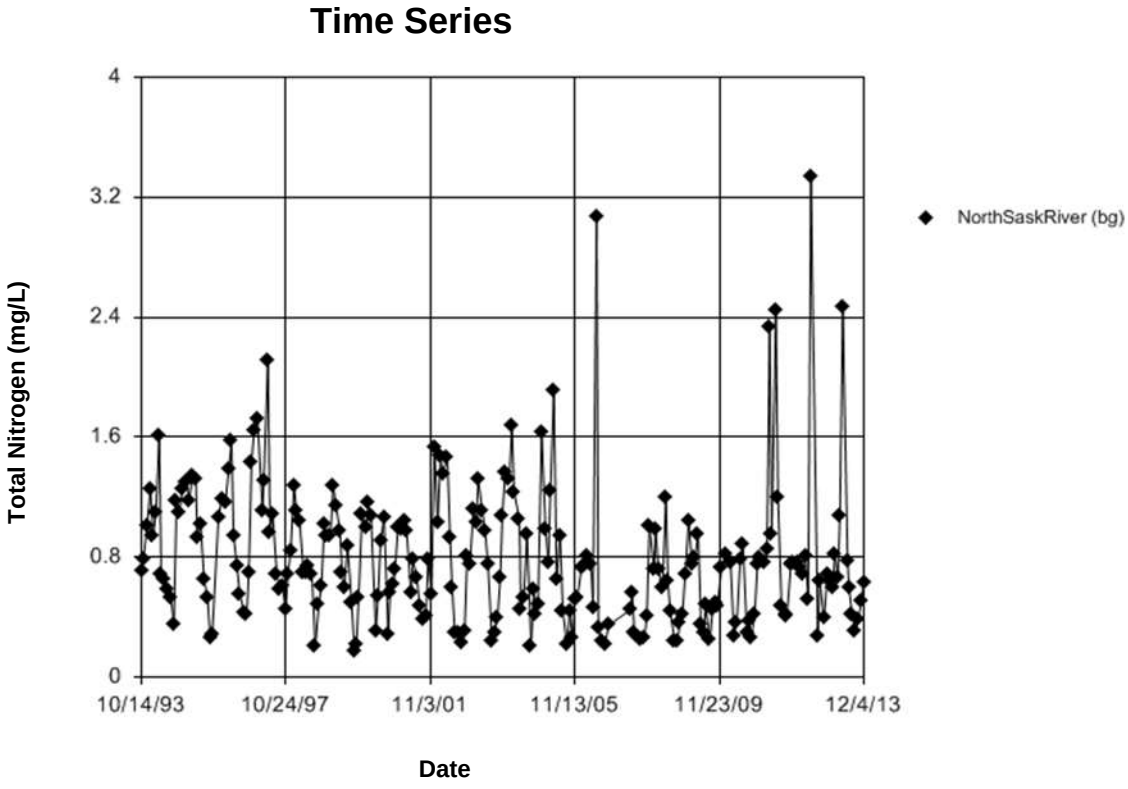


Figure B52 North Saskatchewan River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 51.86
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 51.86
Adjusted Kruskal-Wallis statistic (H') = 51.86

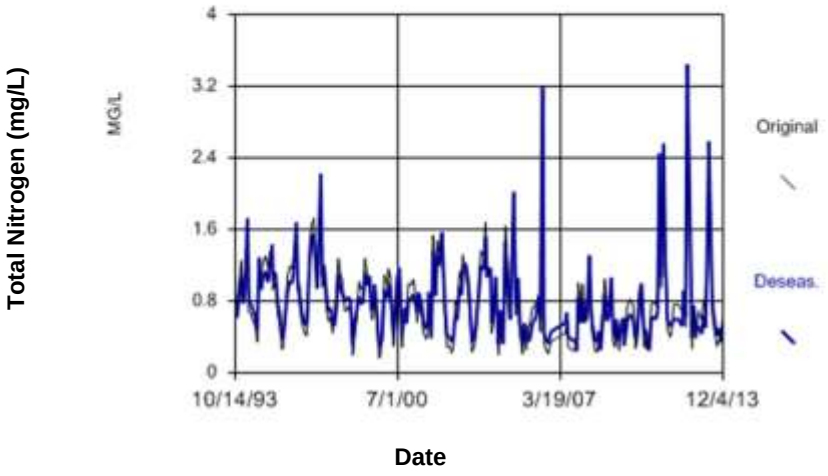


Figure B53 North Saskatchewan River: Total Nitrogen

Seasonal Kendall

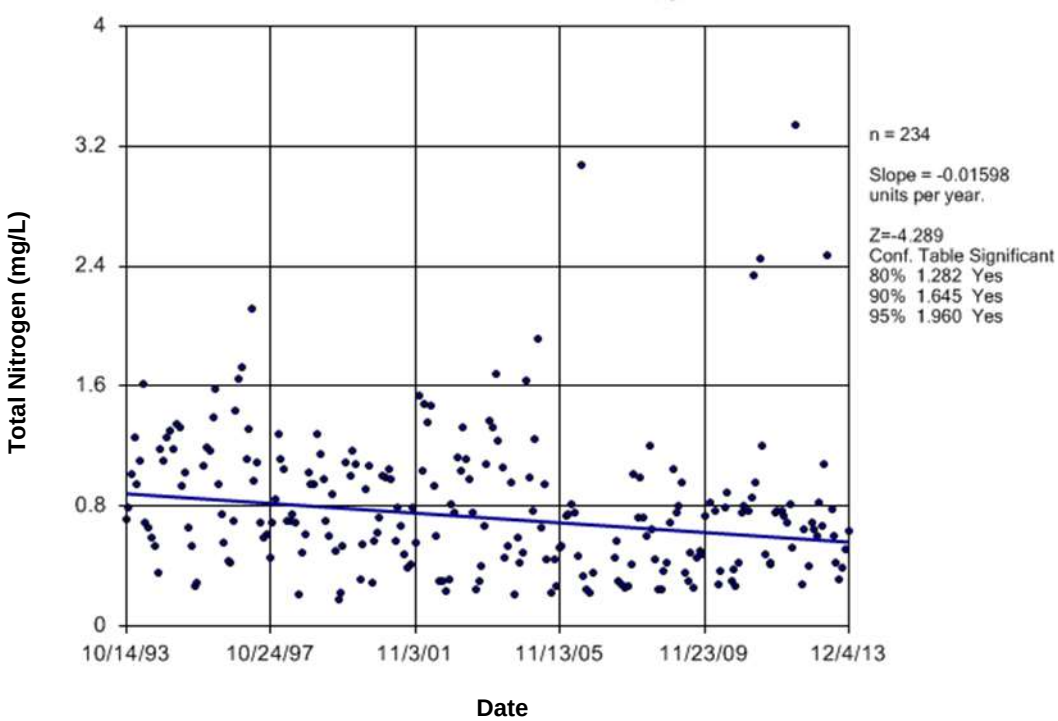


Figure B54 North Saskatchewan River: Total Nitrogen

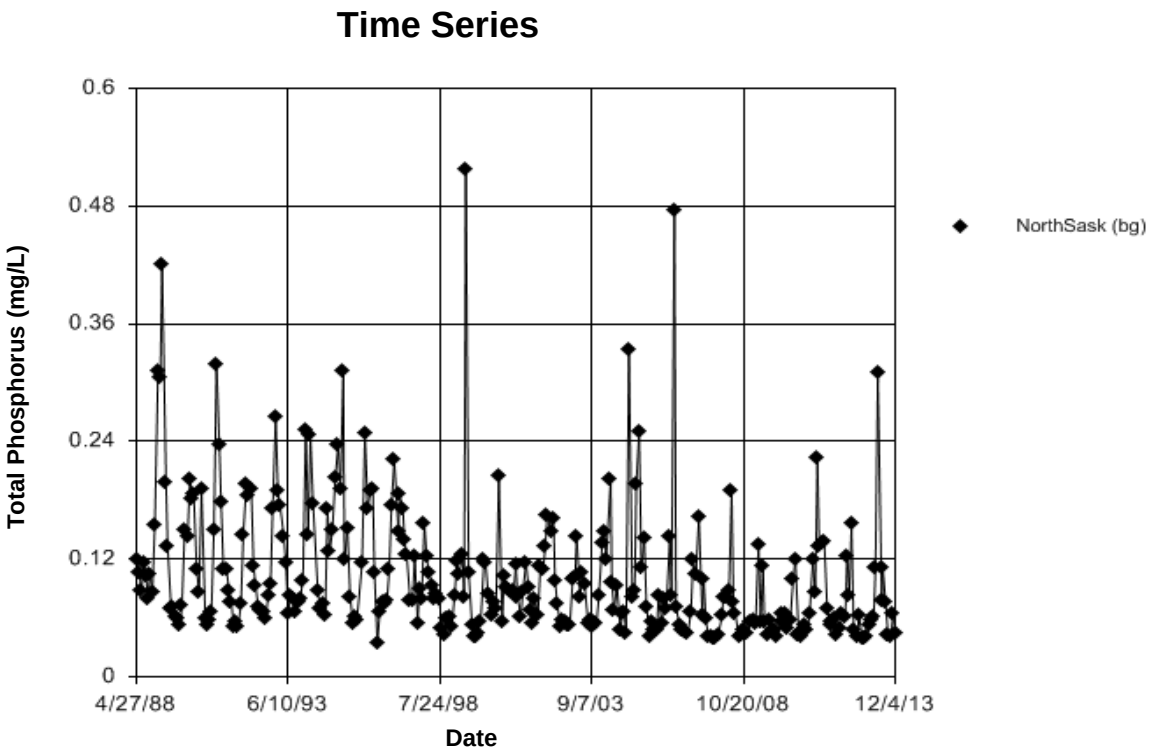


Figure B55 North Saskatchewan River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 8.374
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 11 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.374
Adjusted Kruskal-Wallis statistic (H') = 8.374

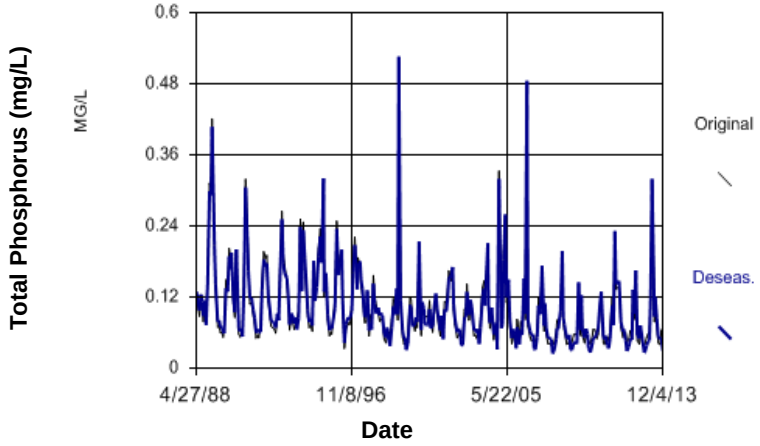


Figure B56 North Saskatchewan River: Total Phosphorus

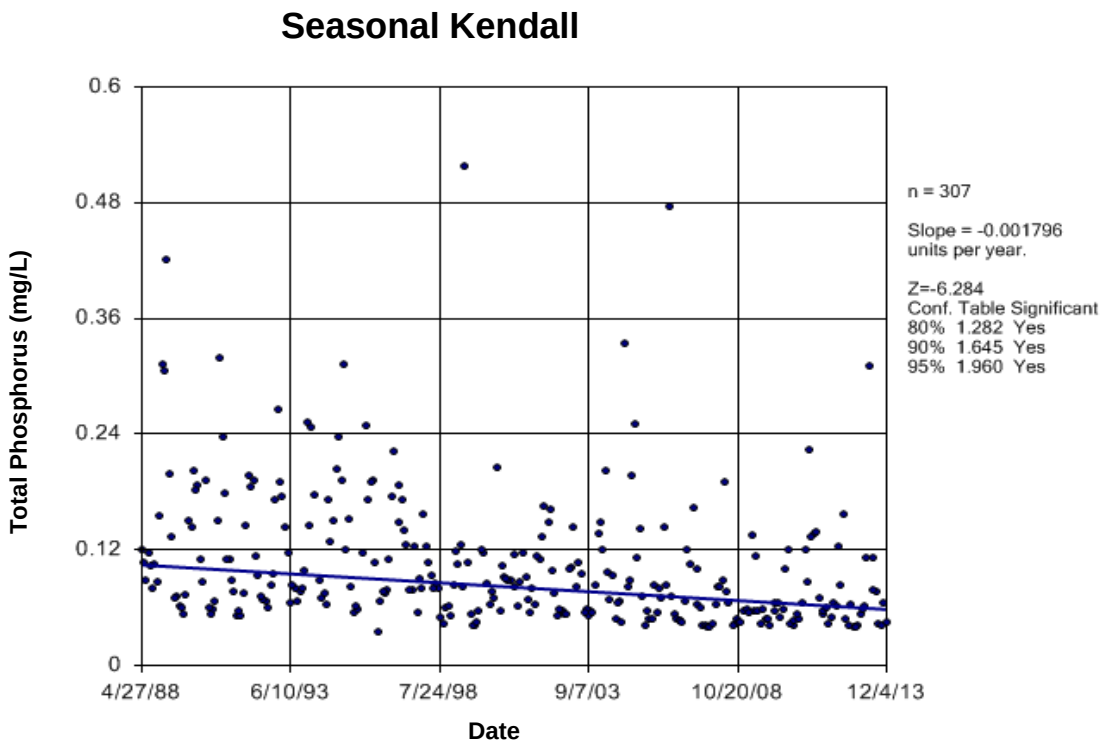


Figure B57 North Saskatchewan River: Total Phosphorus

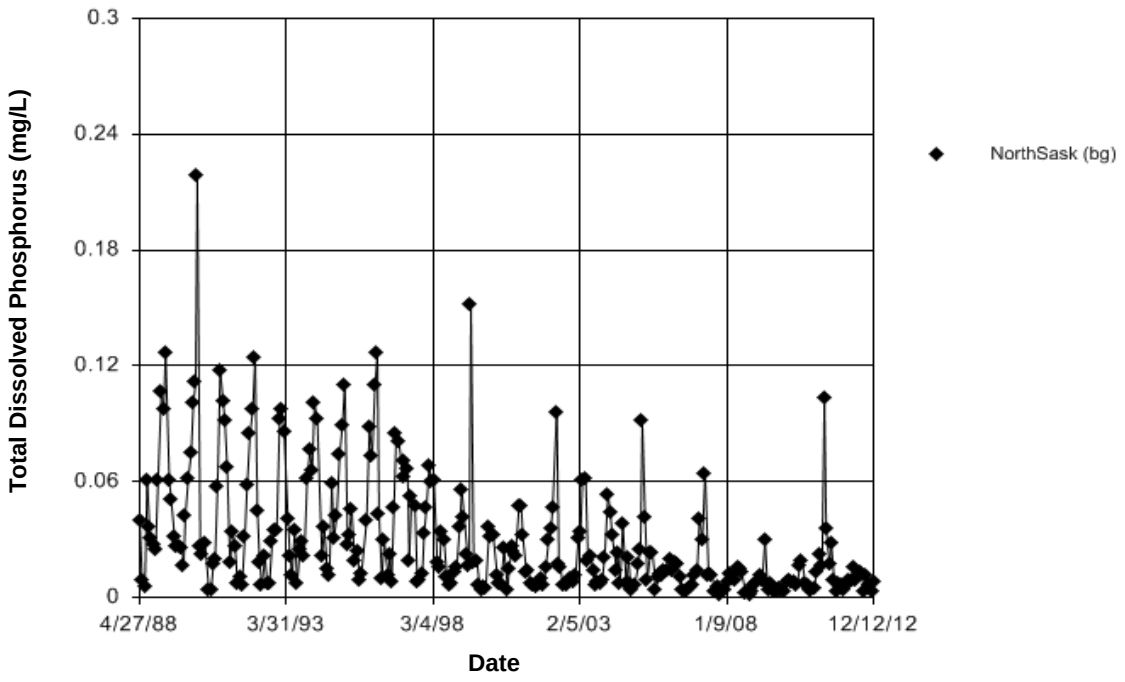


Figure B58 North Saskatchewan River: Total Dissolved Phosphorus

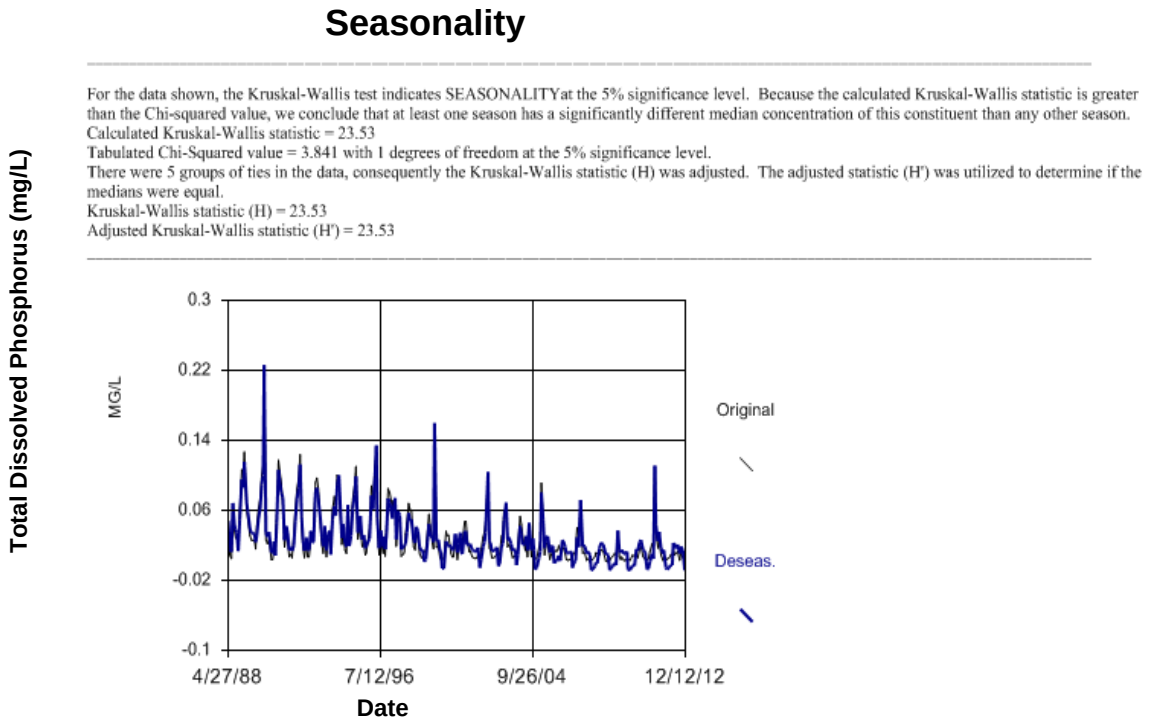


Figure B59 North Saskatchewan River: Total Dissolved Phosphorus

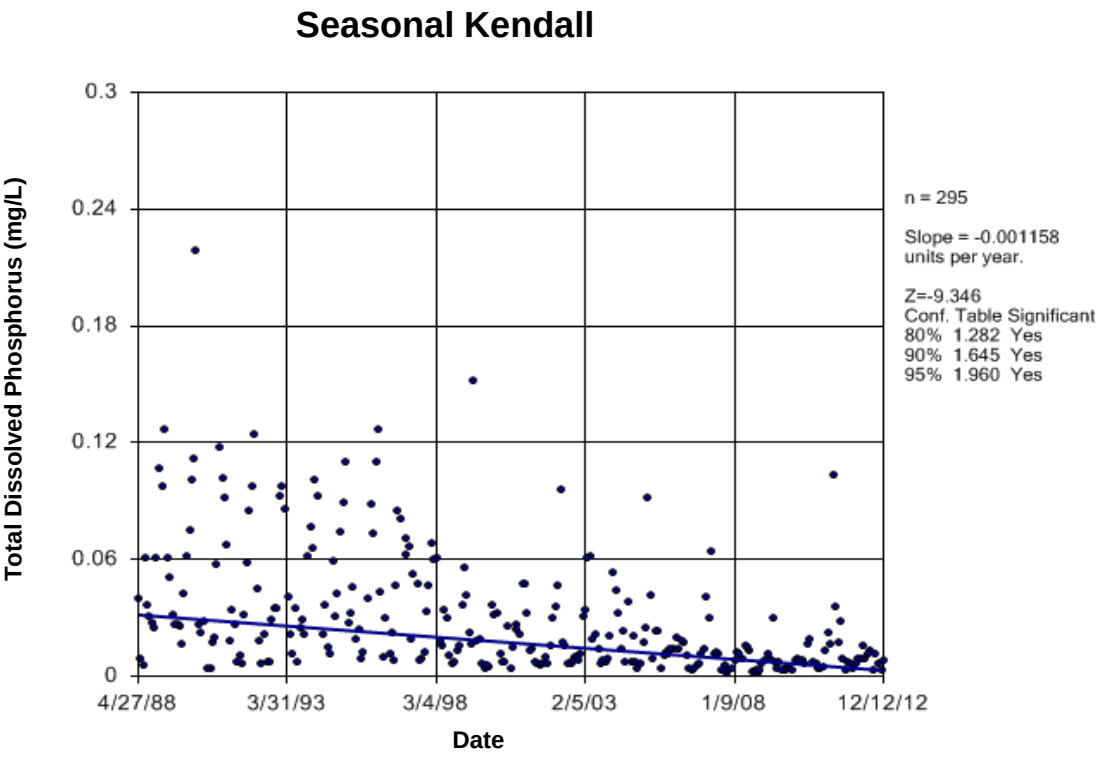


Figure B60 North Saskatchewan River: Total Dissolved Phosphorus

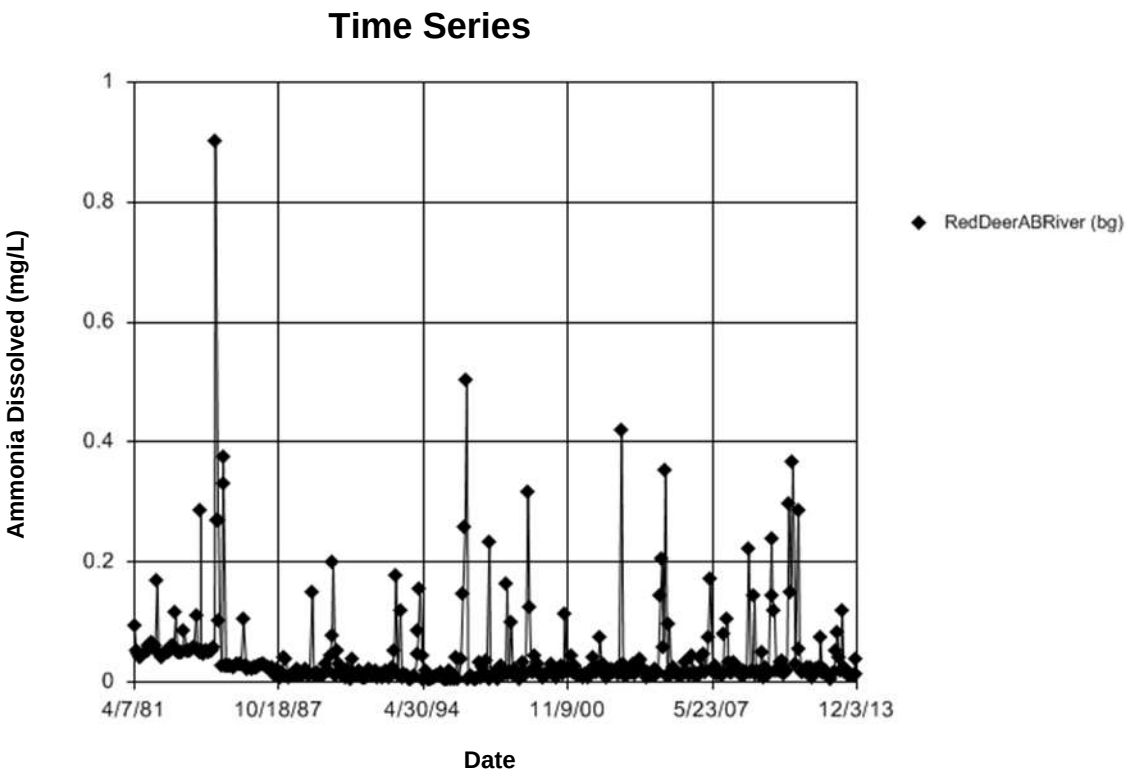


Figure B61 Red Deer River (AB-SK): Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 20.16
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 18 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 20.16
Adjusted Kruskal-Wallis statistic (H') = 20.16

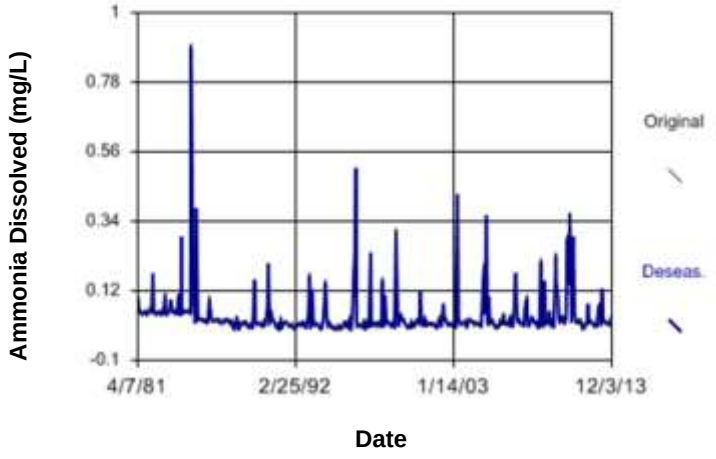


Figure B62 Red Deer River (AB-SK): Ammonia Dissolved

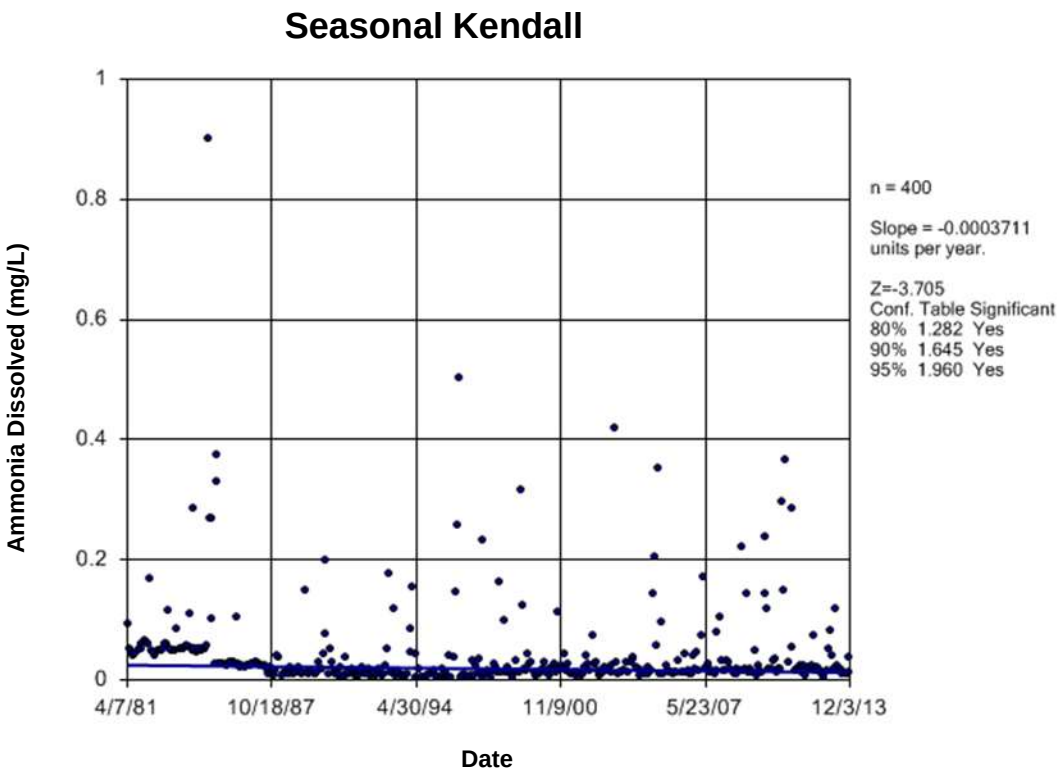


Figure B63 Red Deer River (AB-SK): Ammonia Dissolved

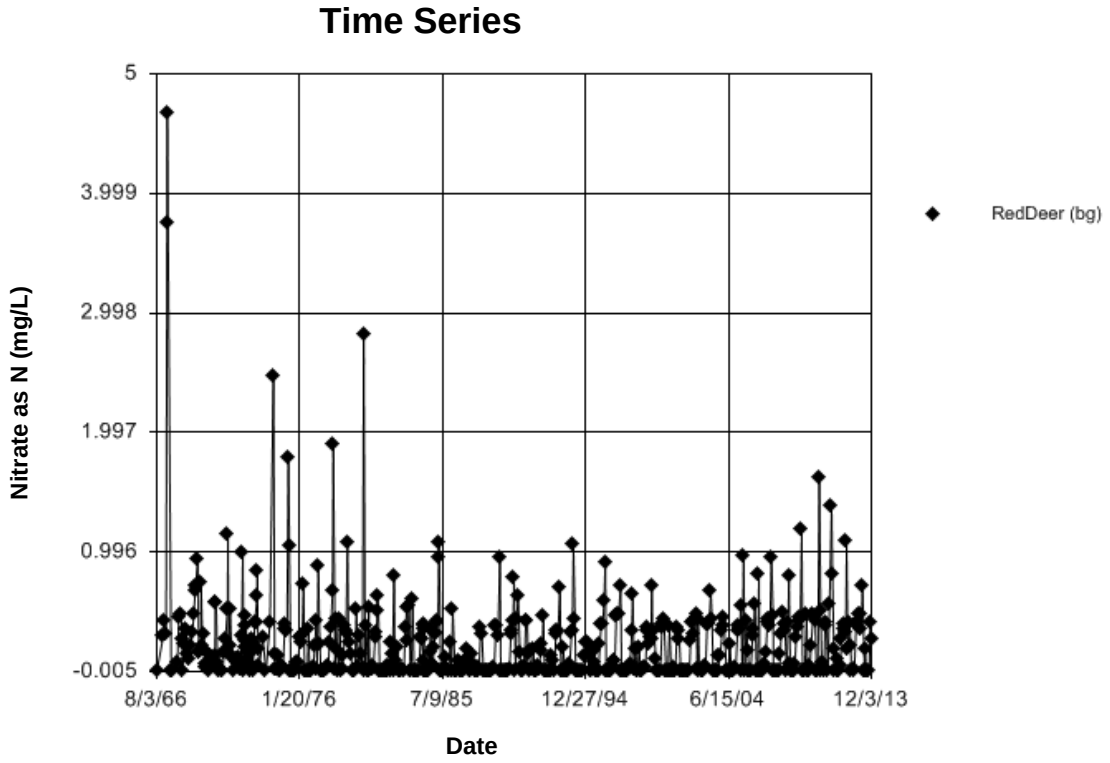


Figure B64 Red Deer River (AB-SK): Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 58.12
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 58.12
Adjusted Kruskal-Wallis statistic (H') = 58.12

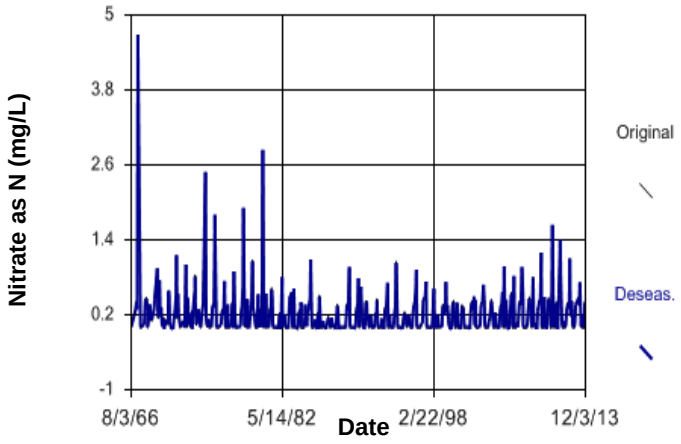


Figure B65 Red Deer River (AB-SK): Nitrate as N

Seasonal Kendall

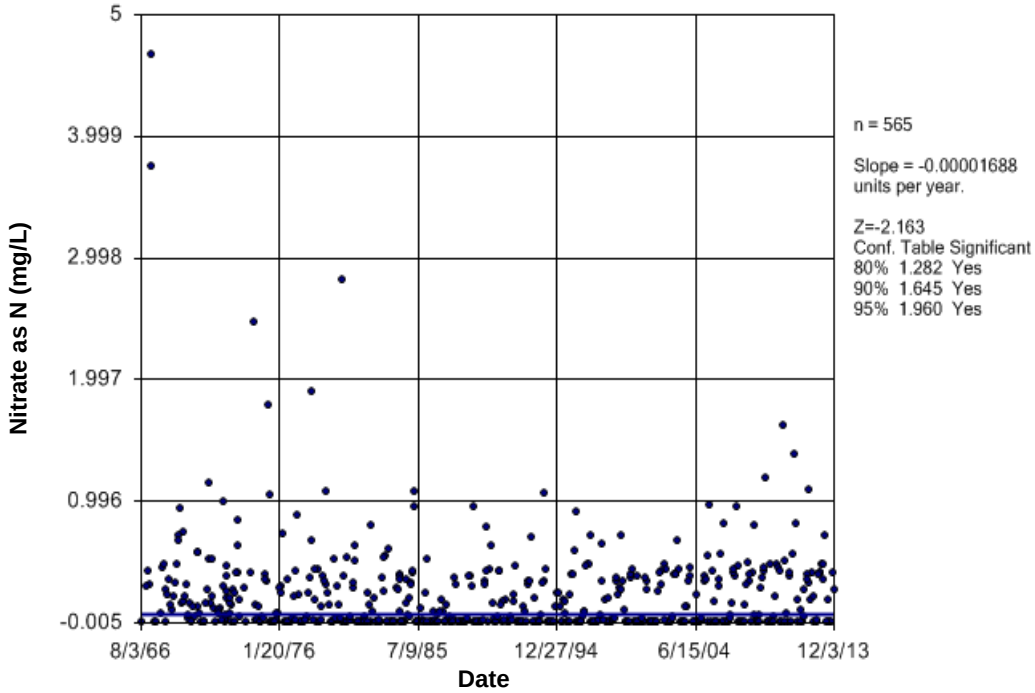


Figure B66 Red Deer River (AB-SK): Nitrate as N

Time Series

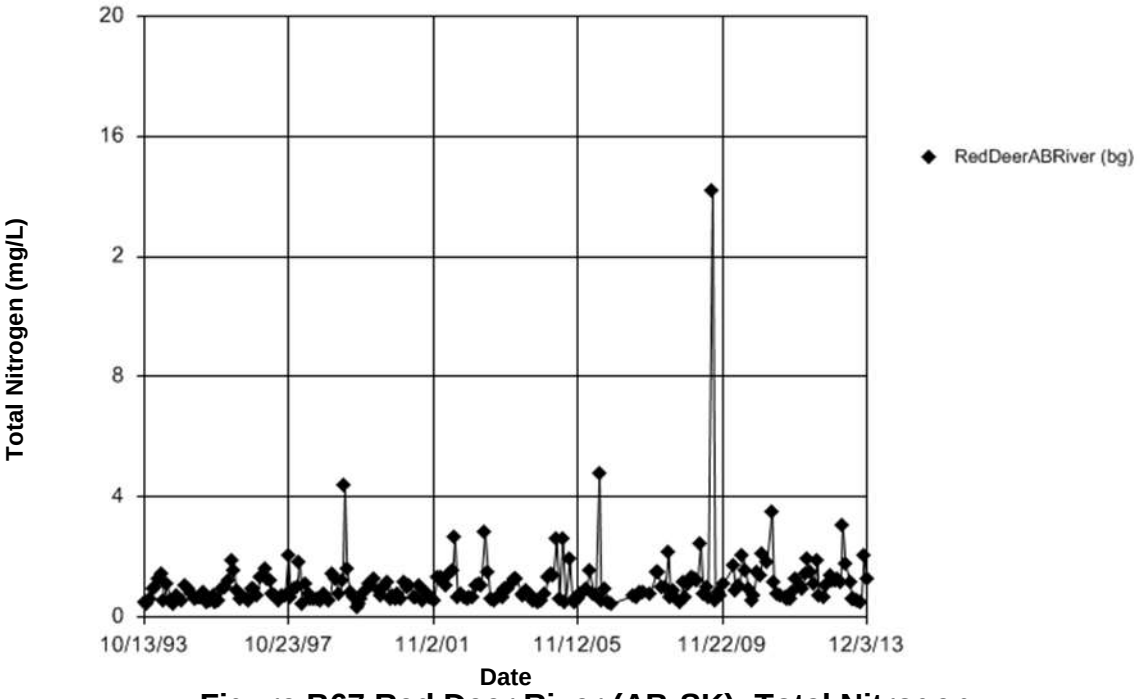


Figure B67 Red Deer River (AB-SK): Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 17.39
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 17.39
Adjusted Kruskal-Wallis statistic (H') = 17.39

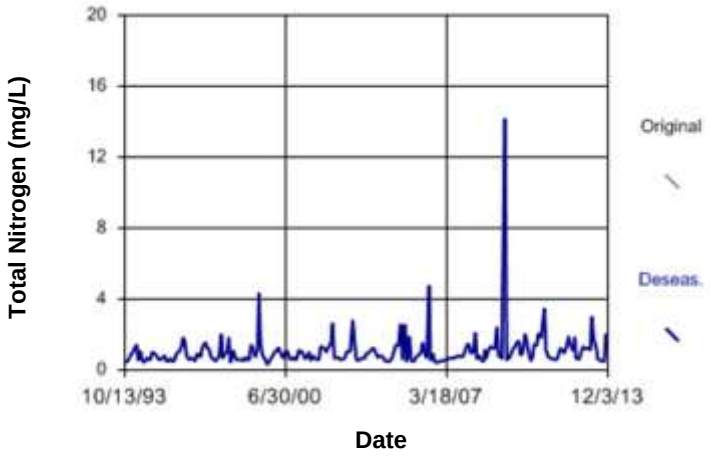


Figure B68 Red Deer River (AB-SK): Total Nitrogen

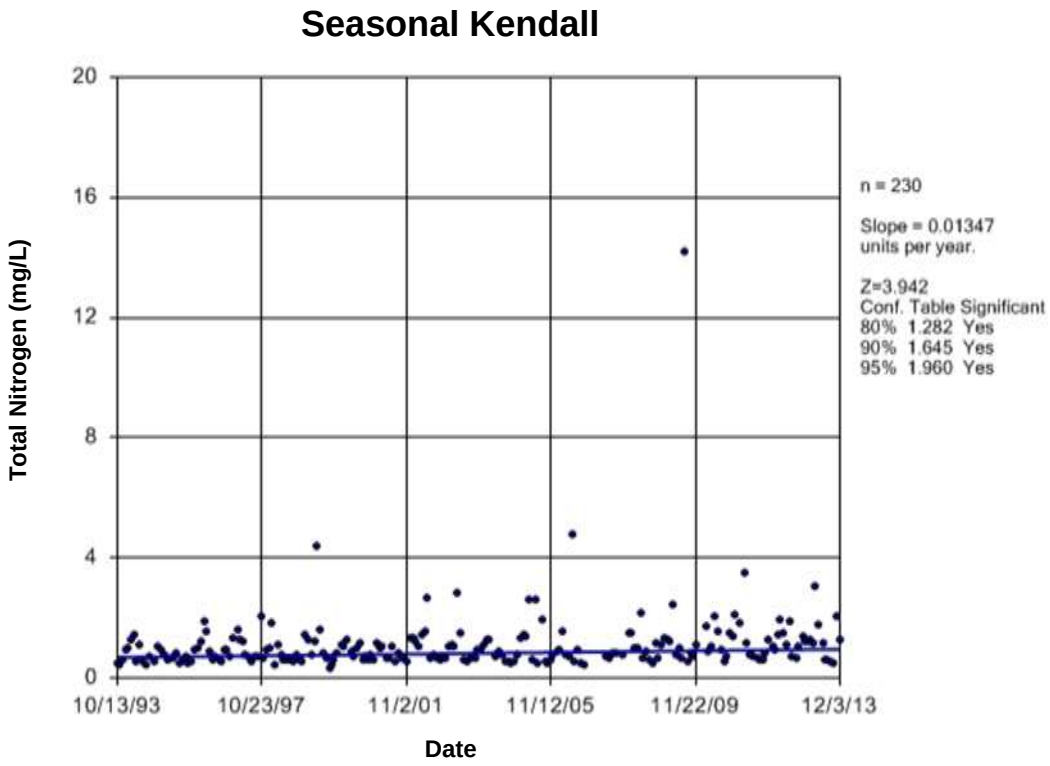


Figure B69 Red Deer River (AB-SK): Total Nitrogen

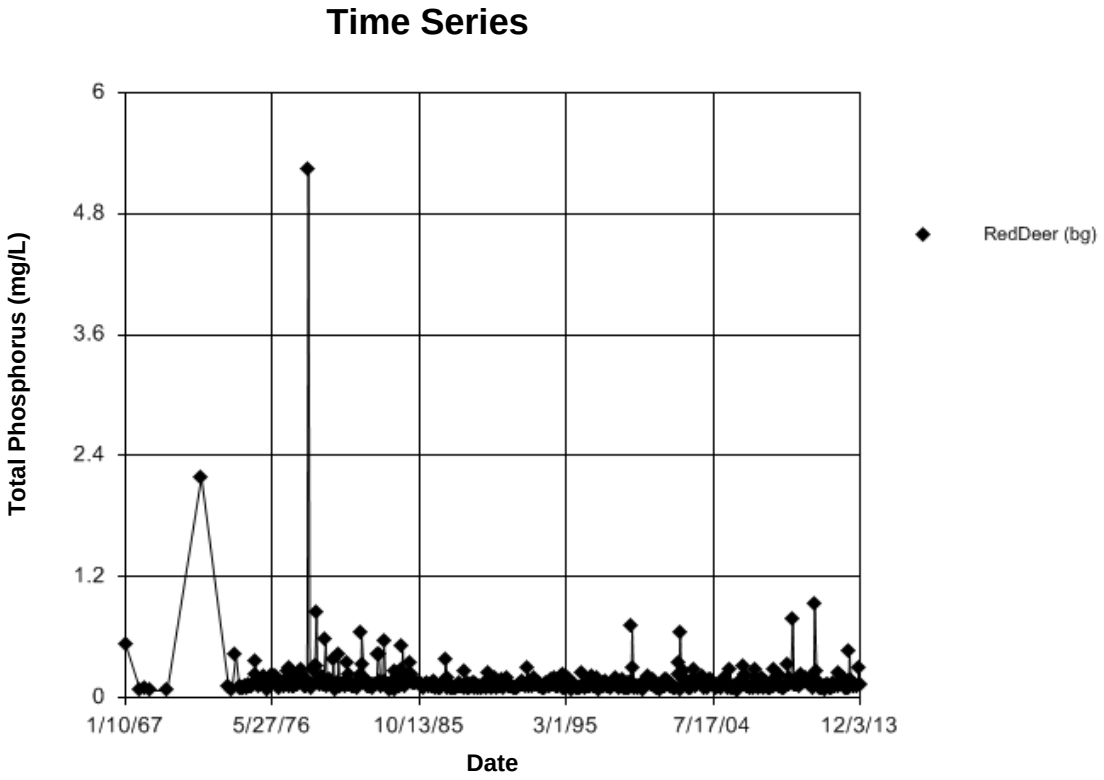


Figure B70 Red Deer River (AB-SK): Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 14.41
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 54 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 14.41
Adjusted Kruskal-Wallis statistic (H') = 14.41

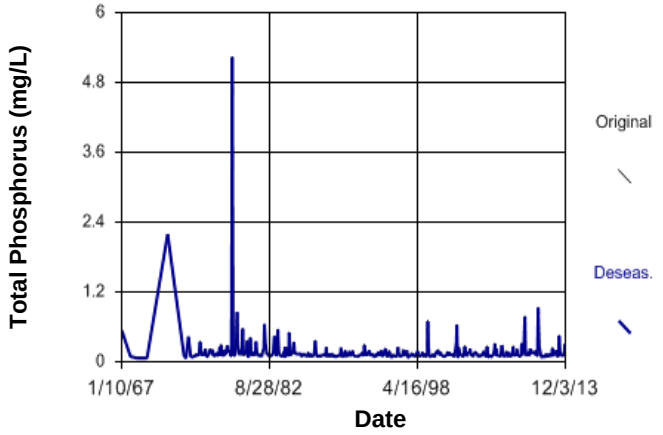


Figure B71 Red Deer River (AB-SK): Total Phosphorus

Seasonal Kendall

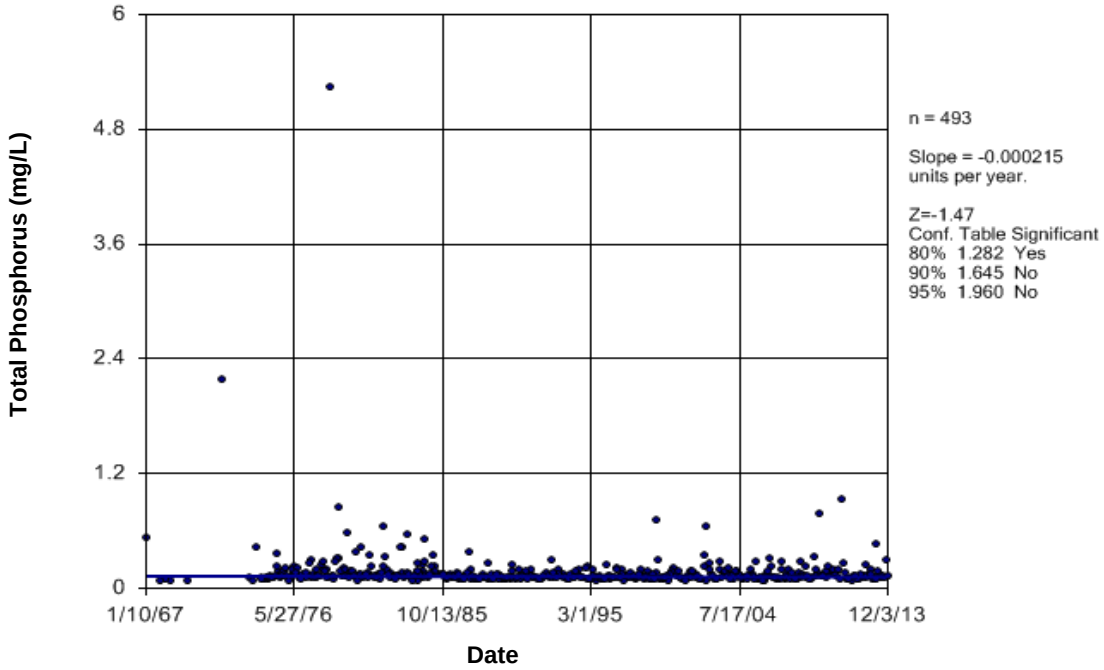


Figure B72 Red Deer River (AB-SK): Total Phosphorus

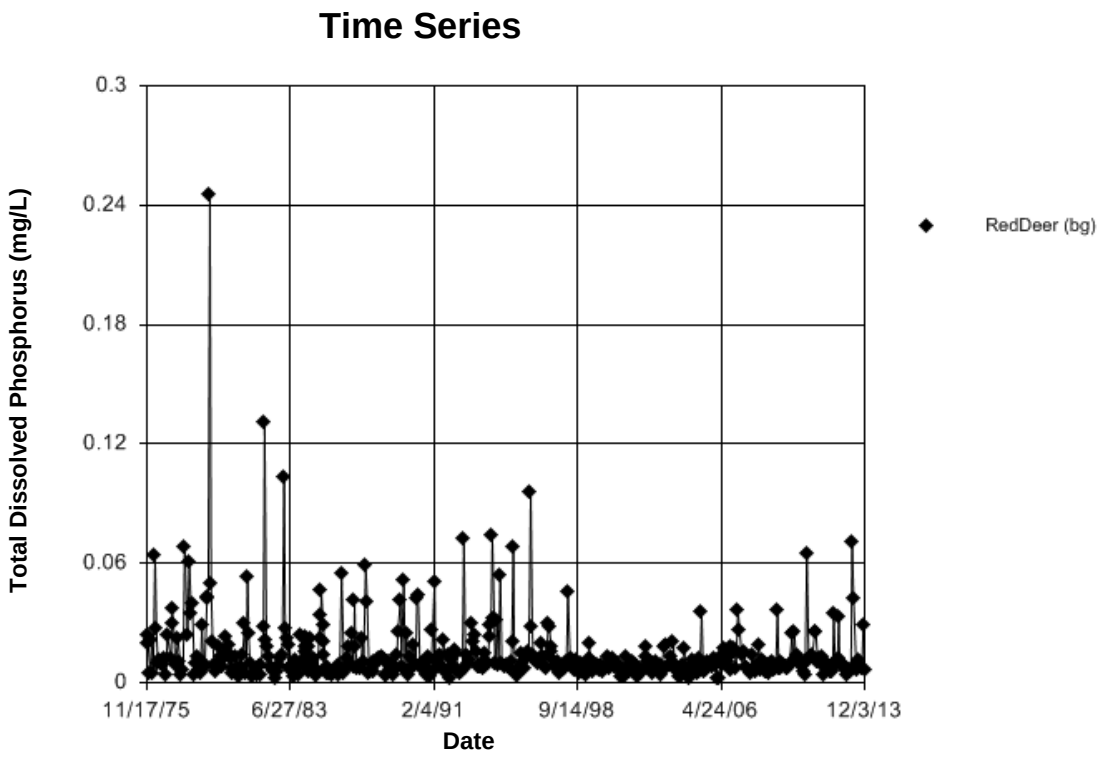


Figure B73 Red Deer River (AB-SK): Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1872
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 25 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1872
Adjusted Kruskal-Wallis statistic (H') = 0.1872

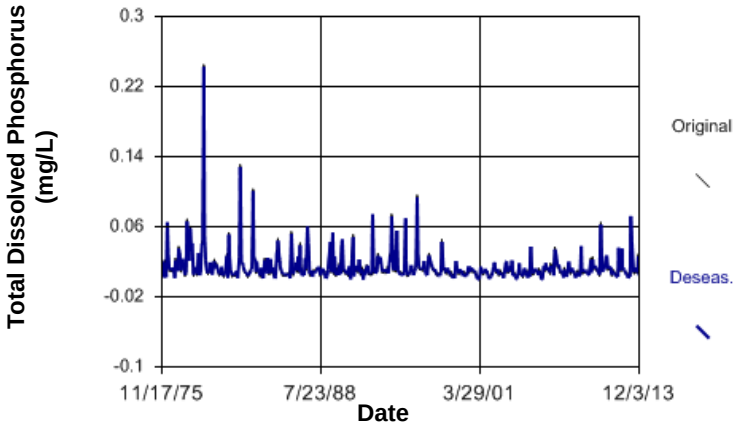


Figure B74 Red Deer River (AB-SK): Total Dissolved Phosphorus

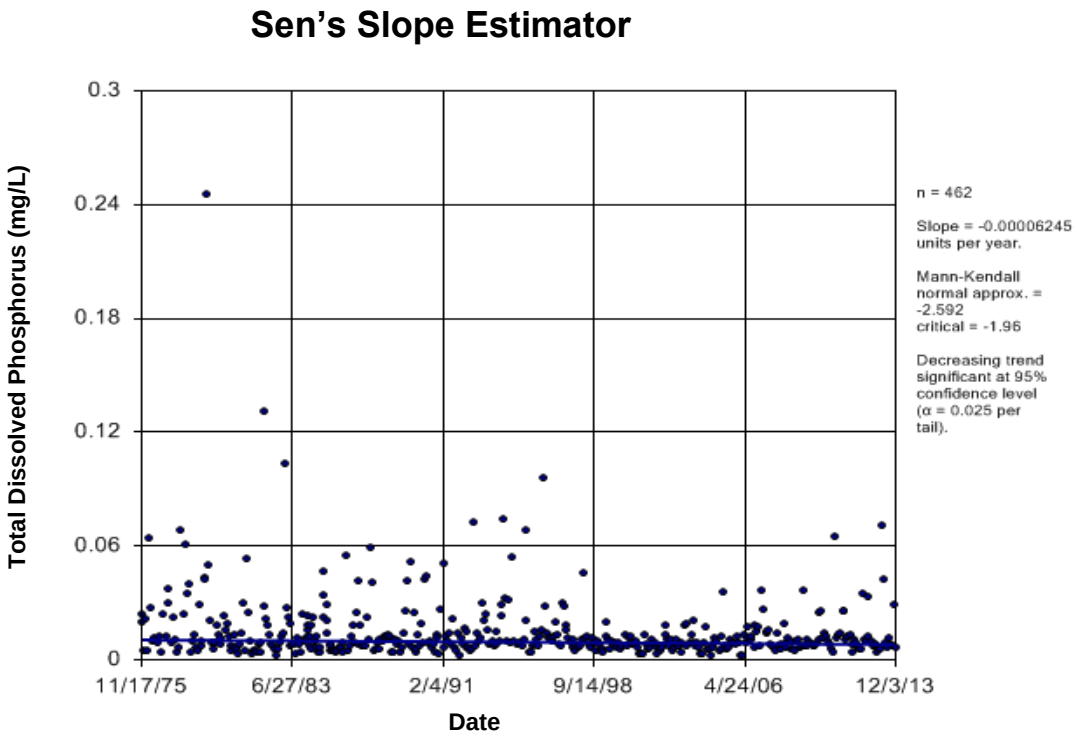


Figure B75 Red Deer River (AB-SK): Total Dissolved Phosphorus

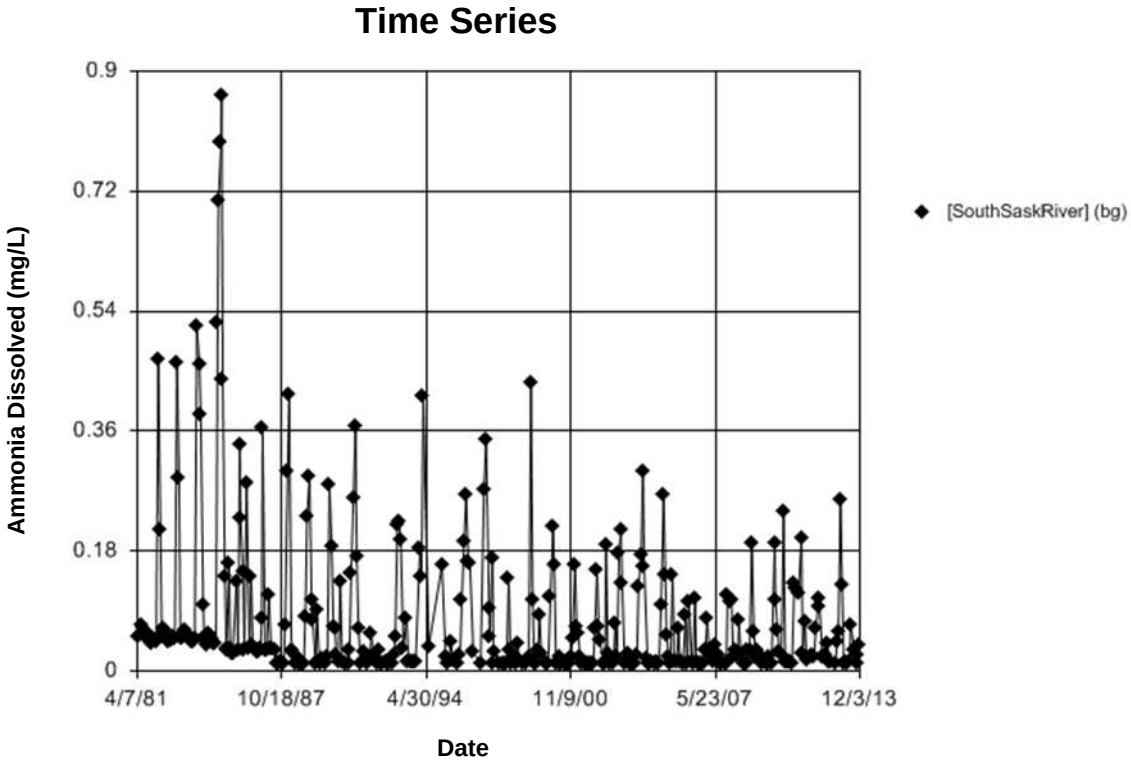


Figure B76 South Saskatchewan River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 90.55
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 19 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 90.55
Adjusted Kruskal-Wallis statistic (H') = 90.55

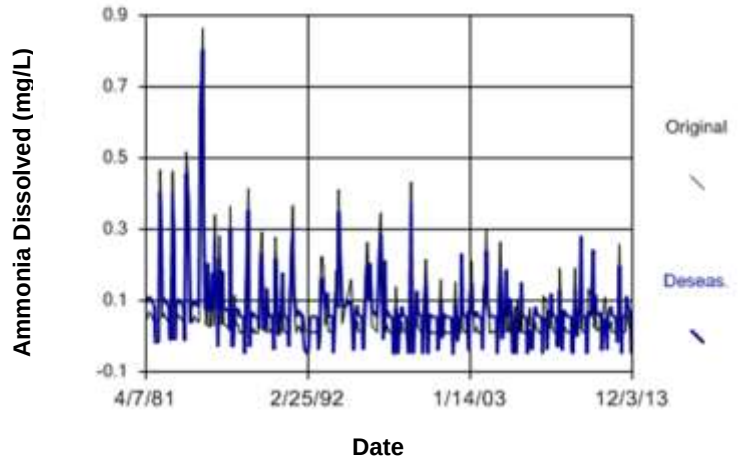


Figure B77 South Saskatchewan River: Ammonia Dissolved

Seasonal Kendall

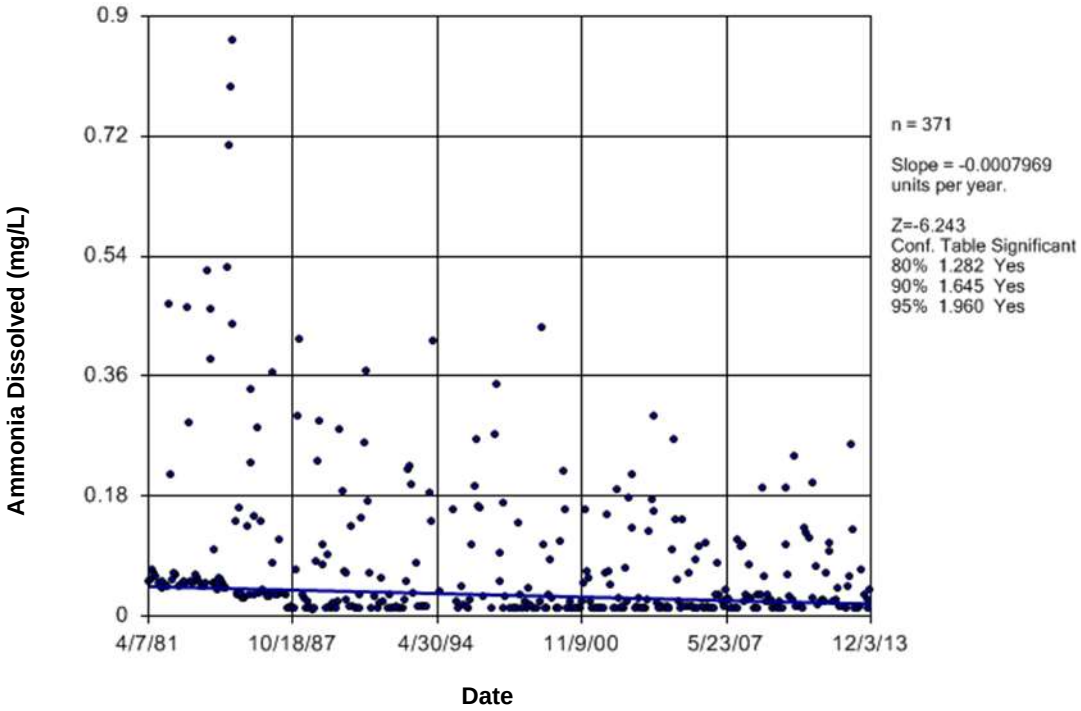


Figure B78 South Saskatchewan River: Ammonia Dissolved

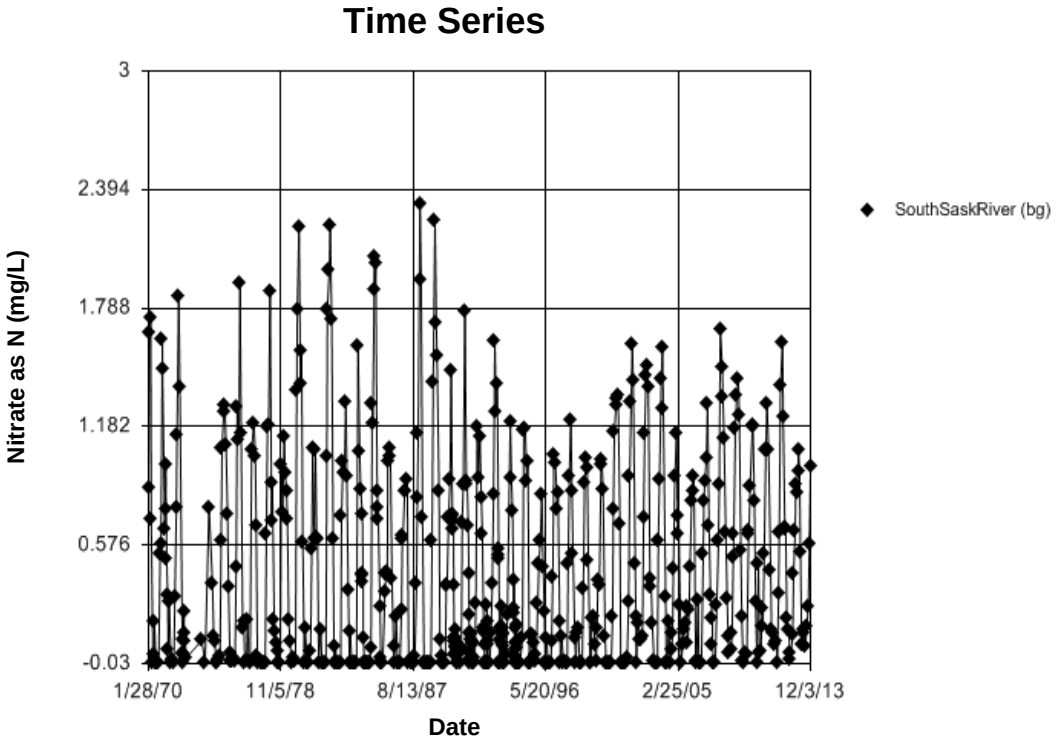


Figure B79 South Saskatchewan River: Nitrate as N

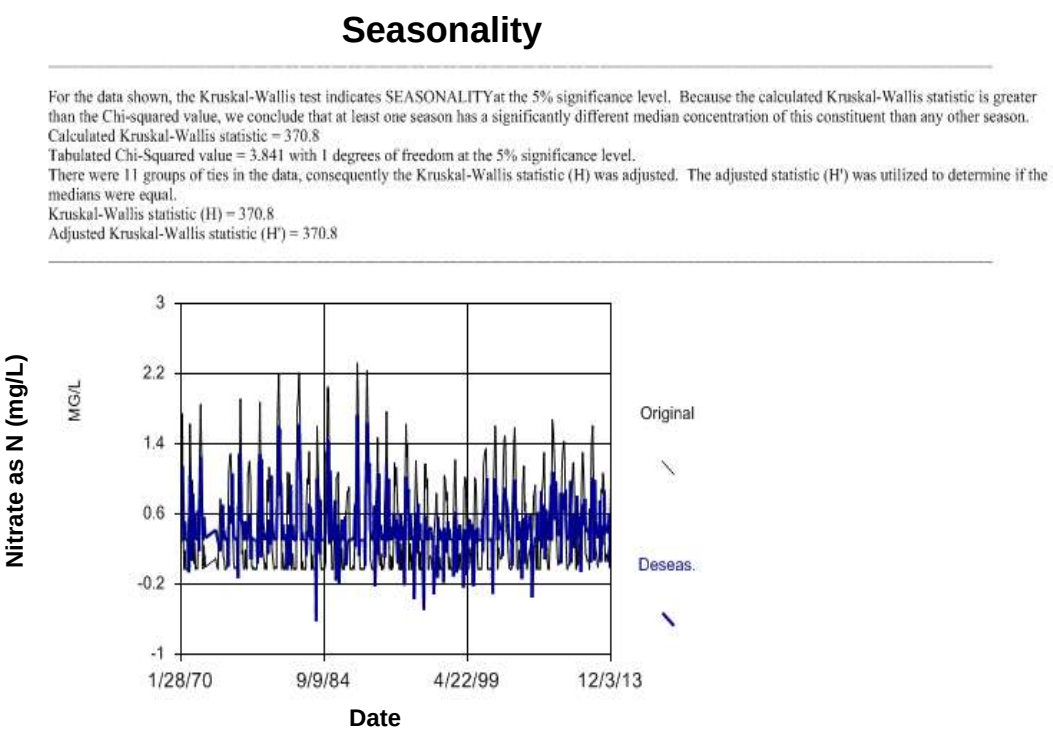


Figure B80 South Saskatchewan River: Nitrate as N

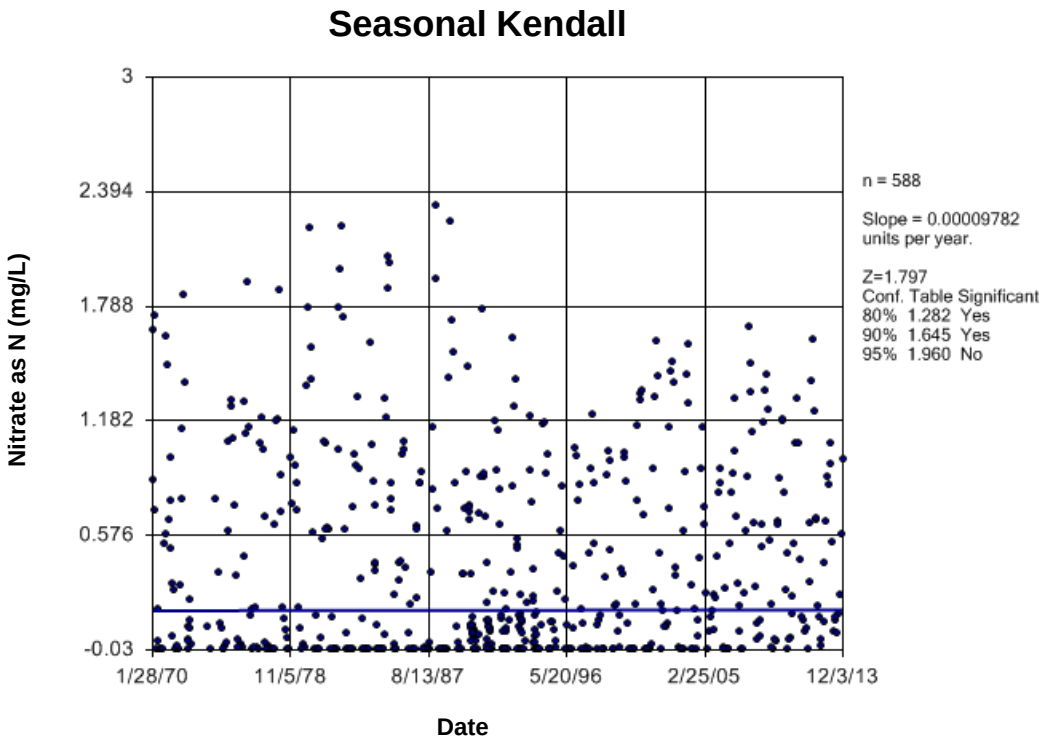


Figure B81 South Saskatchewan River: Nitrate as N

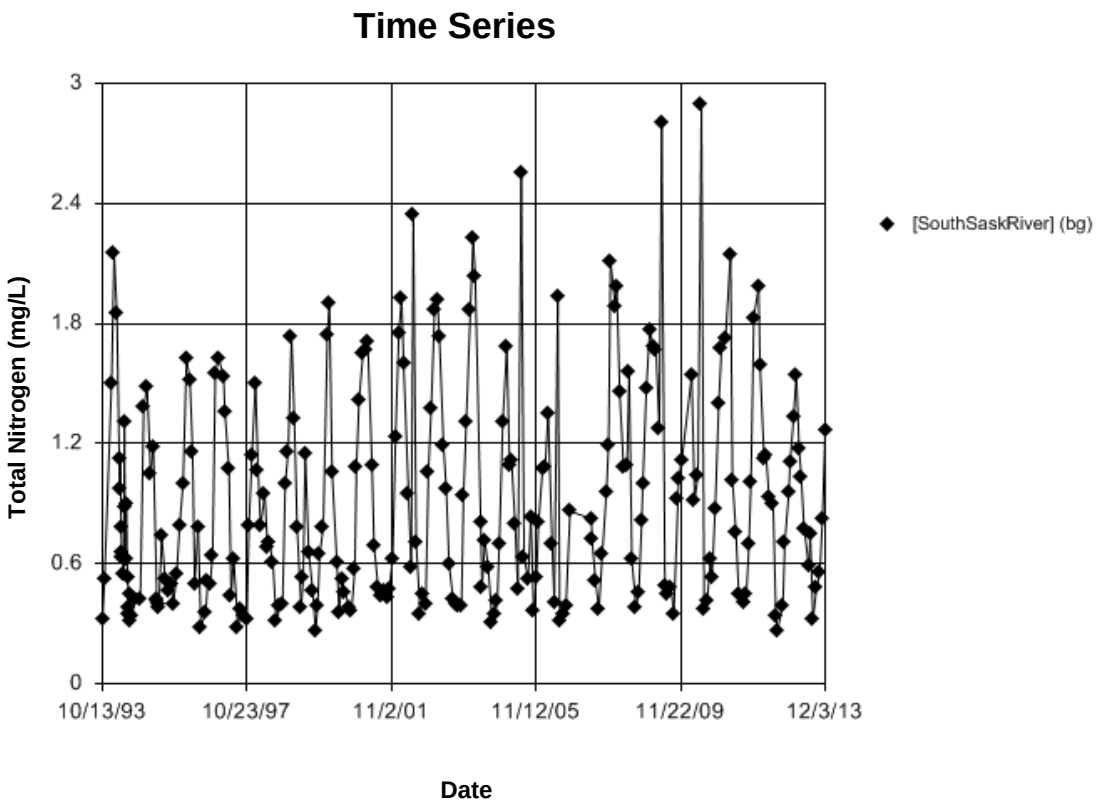


Figure B82 South Saskatchewan River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 104.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 104.7
Adjusted Kruskal-Wallis statistic (H') = 104.7

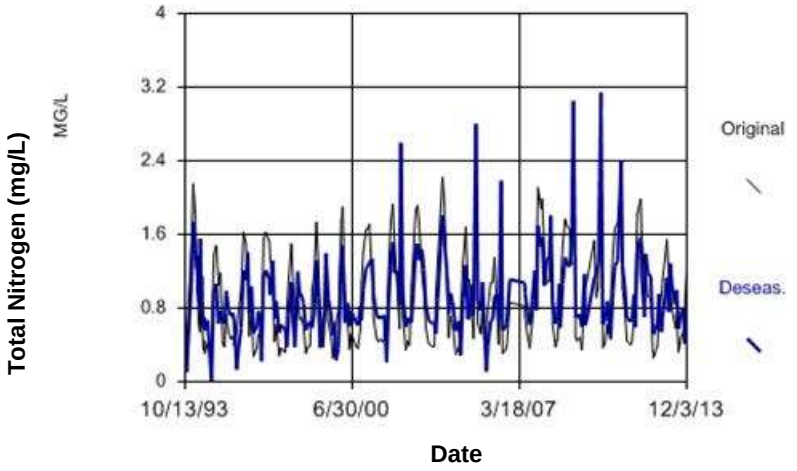


Figure B83 South Saskatchewan River: Total Nitrogen

Seasonal Kendall

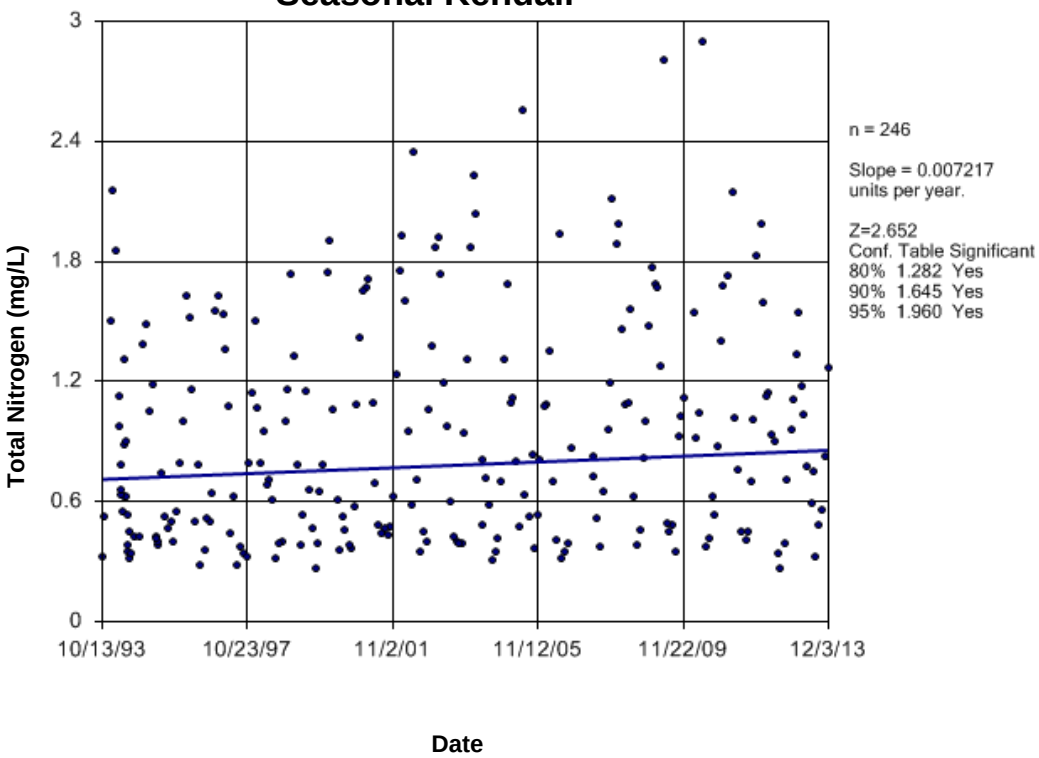


Figure B84 South Saskatchewan River: Total Nitrogen

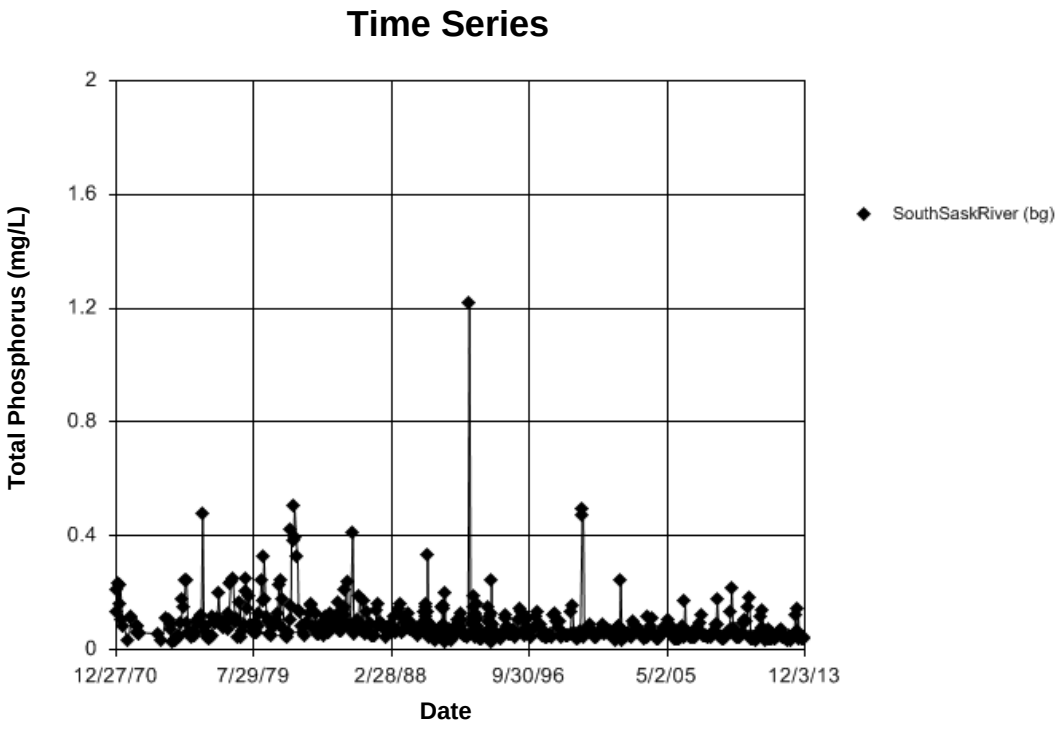


Figure B85 South Saskatchewan River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 6.331
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 6.331
Adjusted Kruskal-Wallis statistic (H') = 6.331

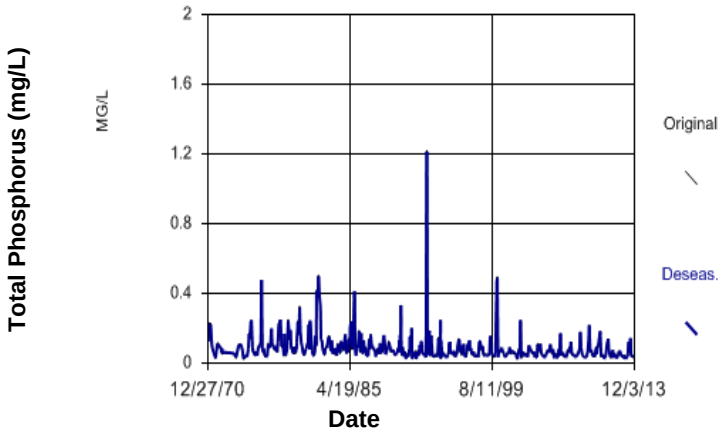


Figure B86 South Saskatchewan River: Total Phosphorus

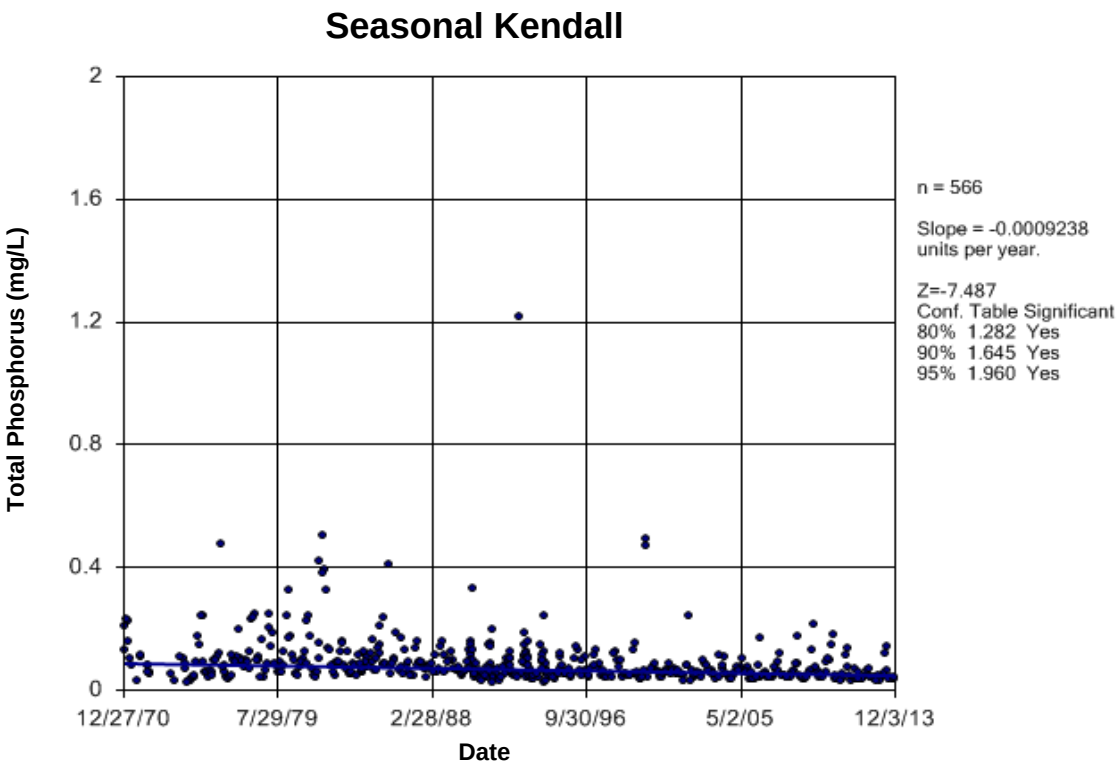


Figure B87 South Saskatchewan River: Total Phosphorus

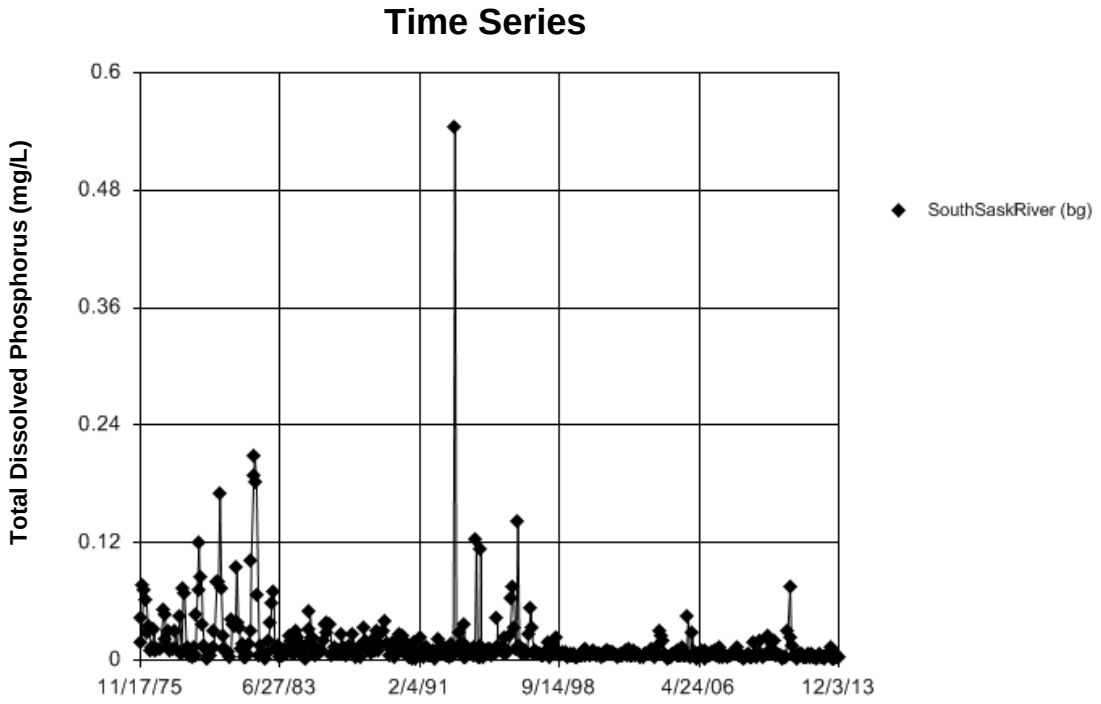


Figure B88 South Saskatchewan River: Total Dissolved Phosphorus

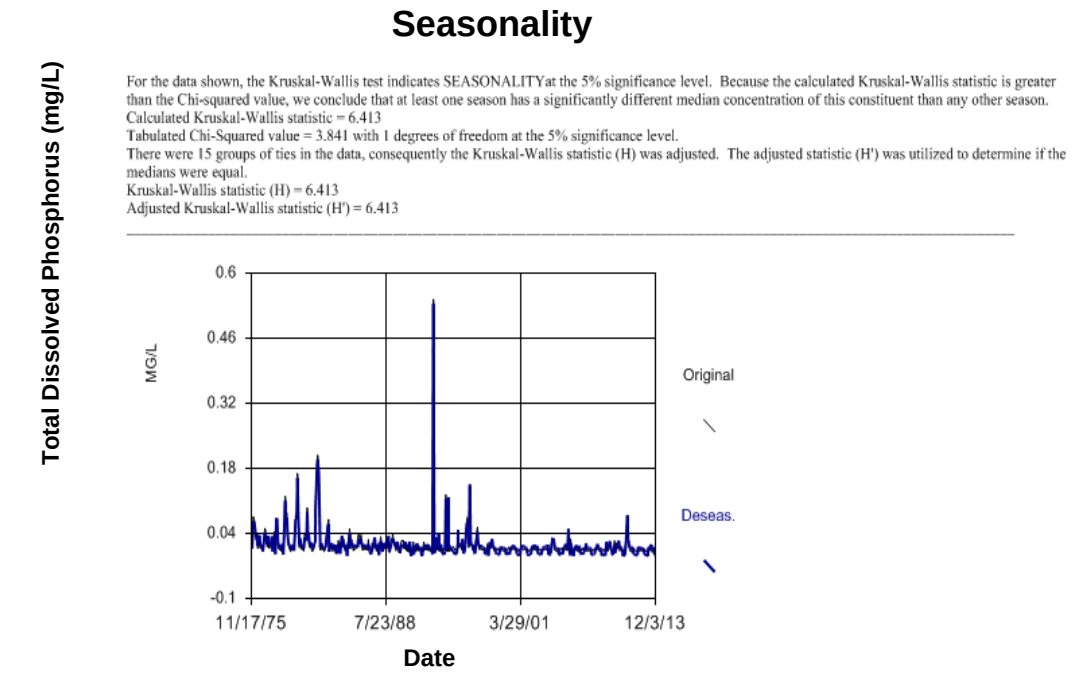


Figure B89 South Saskatchewan River: Total Dissolved Phosphorus

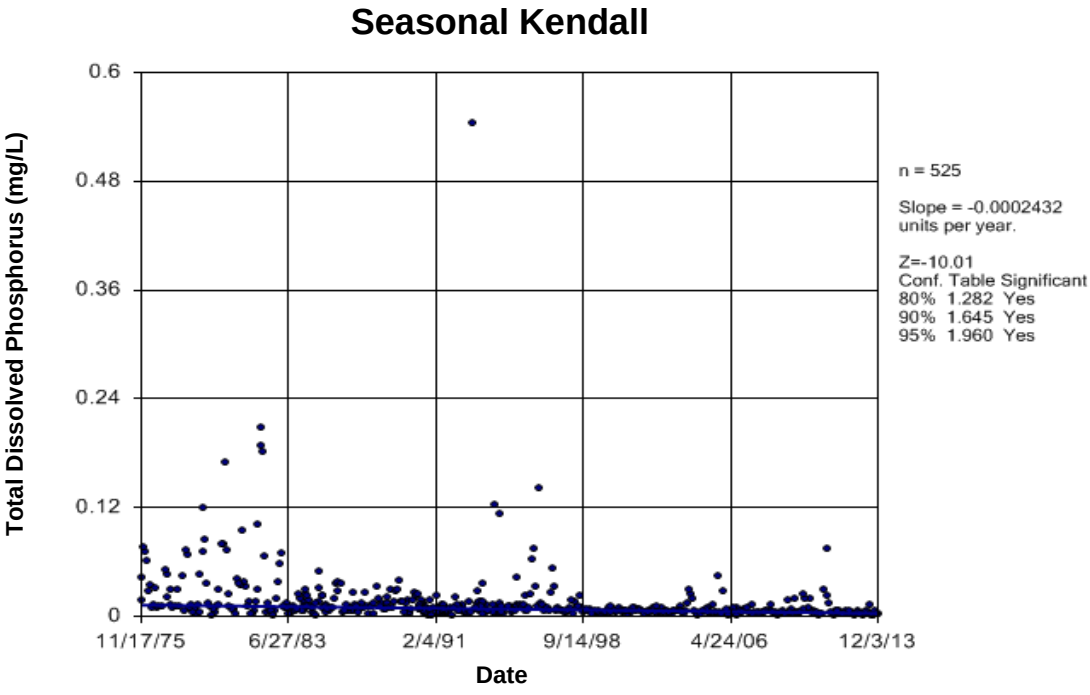


Figure B90 South Saskatchewan River: Total Dissolved Phosphorus

Time Series

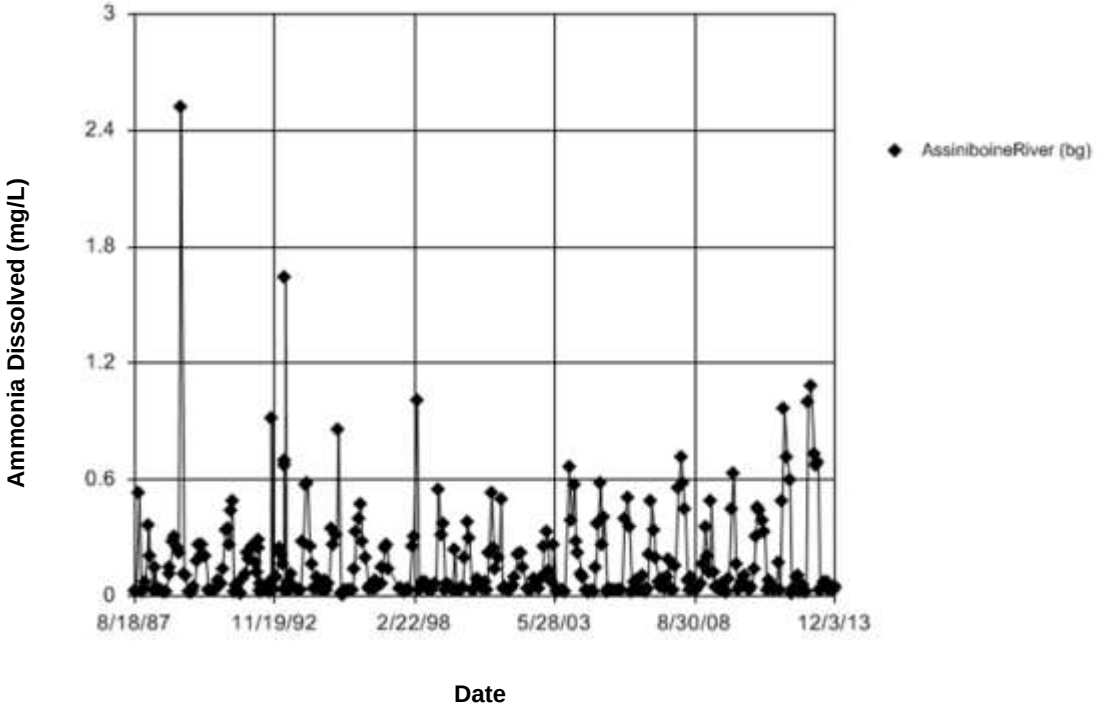


Figure B91 Assiniboine River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 91.16
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 11 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 91.16
Adjusted Kruskal-Wallis statistic (H') = 91.16

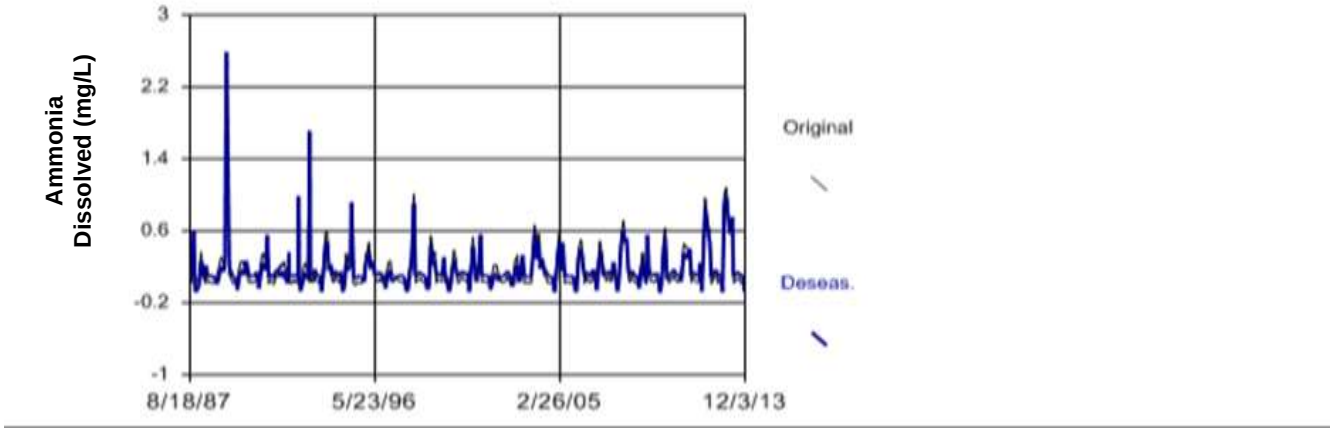


Figure B92 Assiniboine River: Ammonia Dissolved

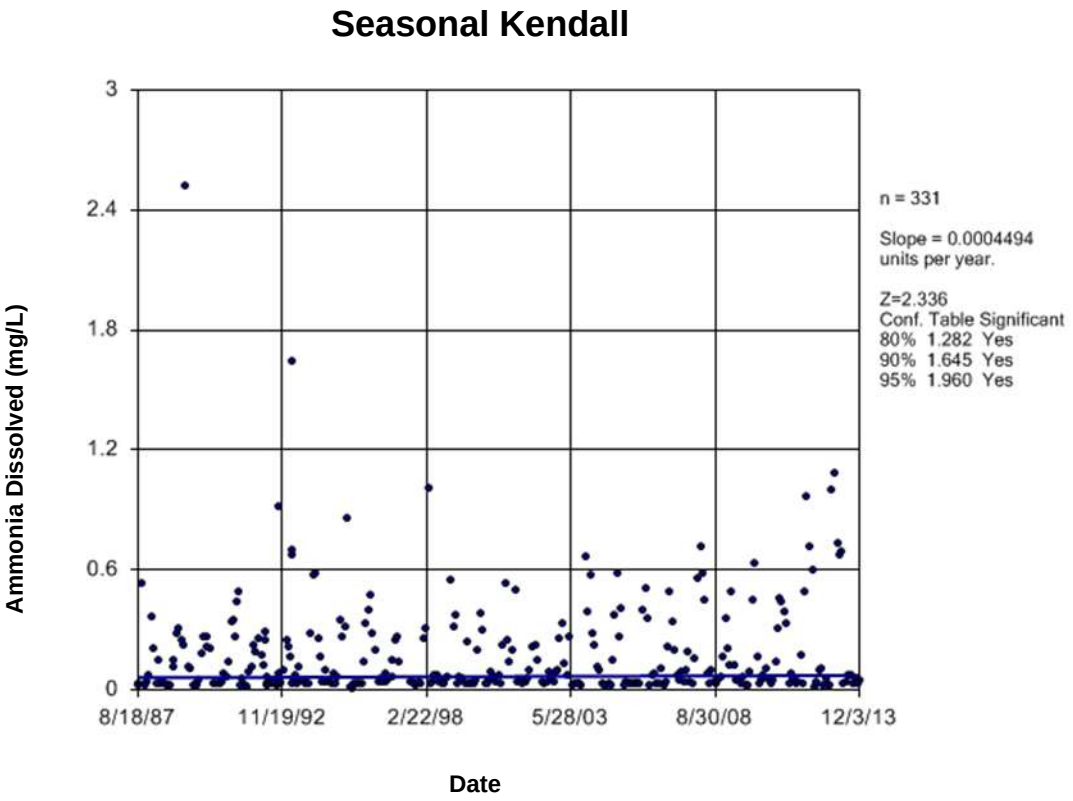


Figure B93 Assiniboine River: Ammonia Dissolved

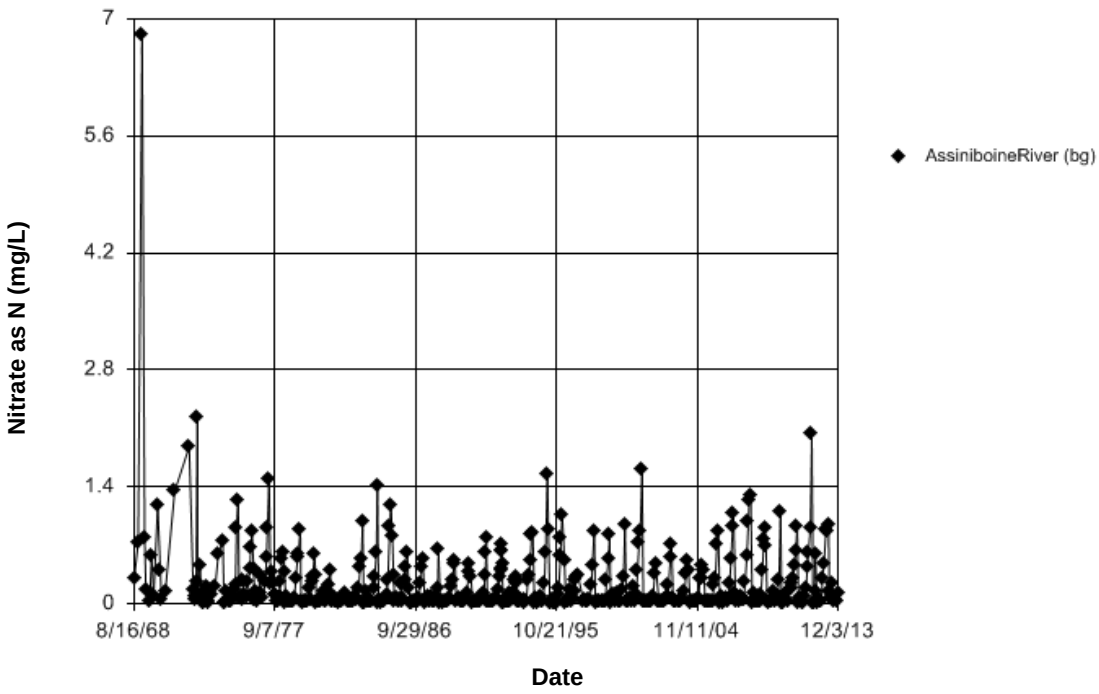


Figure B94 Assiniboine River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 117.1
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 25 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 117.1
Adjusted Kruskal-Wallis statistic (H') = 117.1

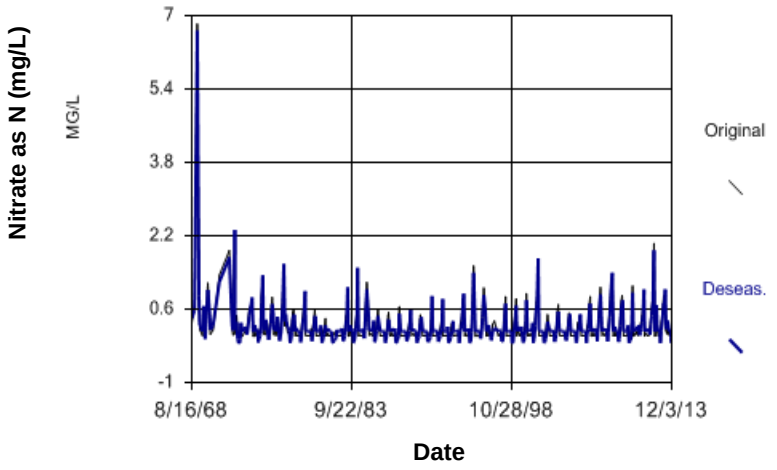


Figure B96 Assiniboine River: Nitrate as N

Seasonal Kendall

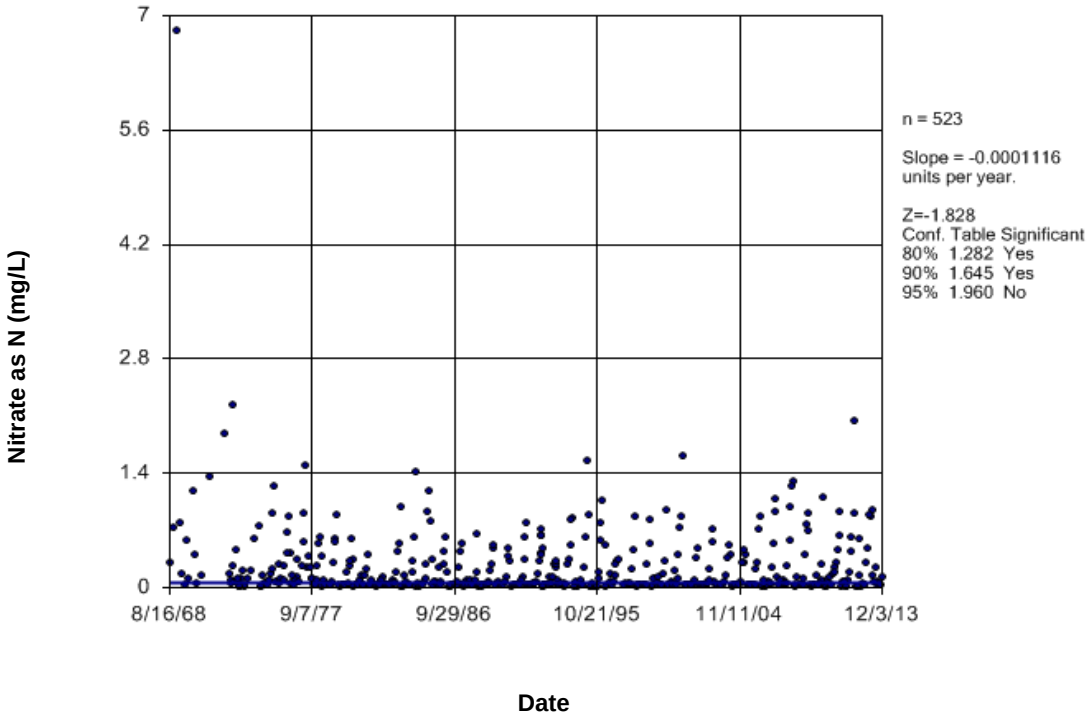


Figure B96 Assiniboine River: Nitrate as N

Time Series

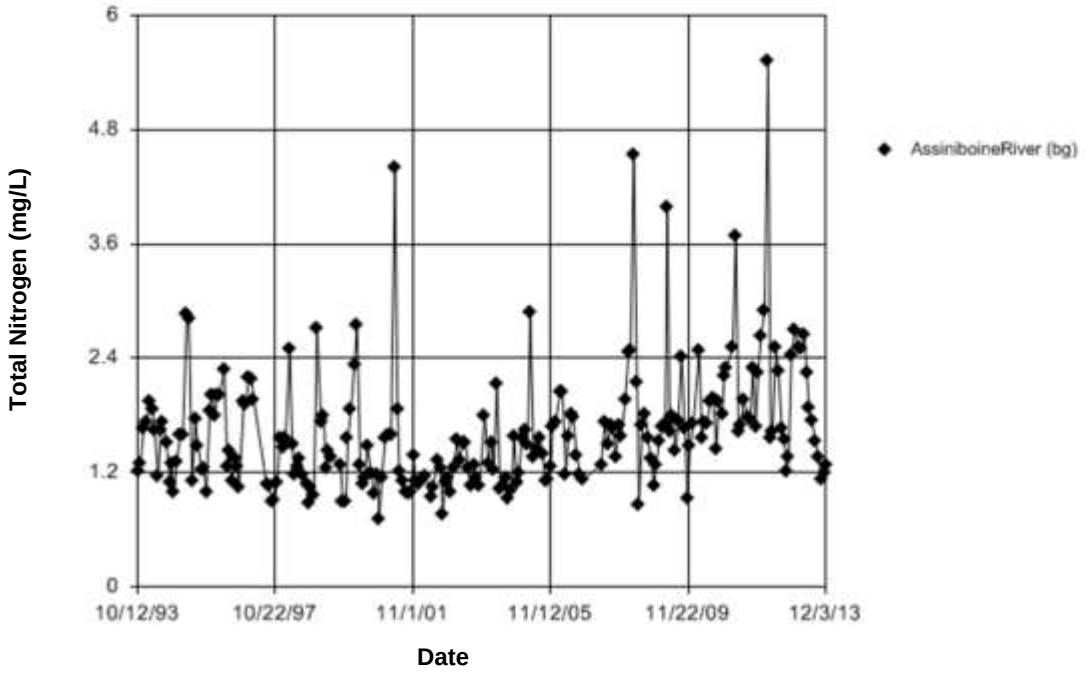


Figure B97 Assiniboine River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 12.8
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 12.8
Adjusted Kruskal-Wallis statistic (H') = 12.8

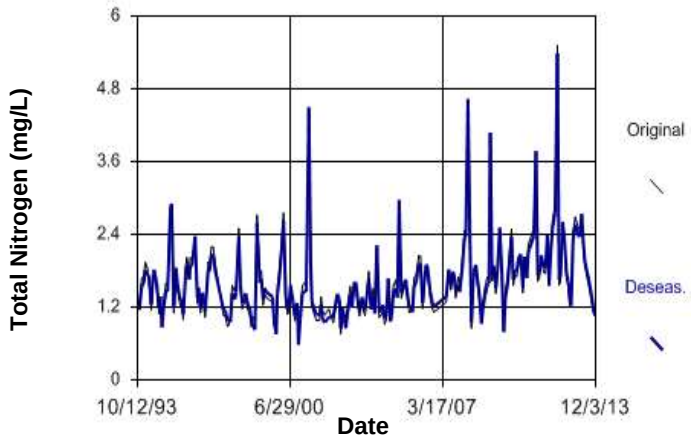


Figure B98 Assiniboine River: Total Nitrogen

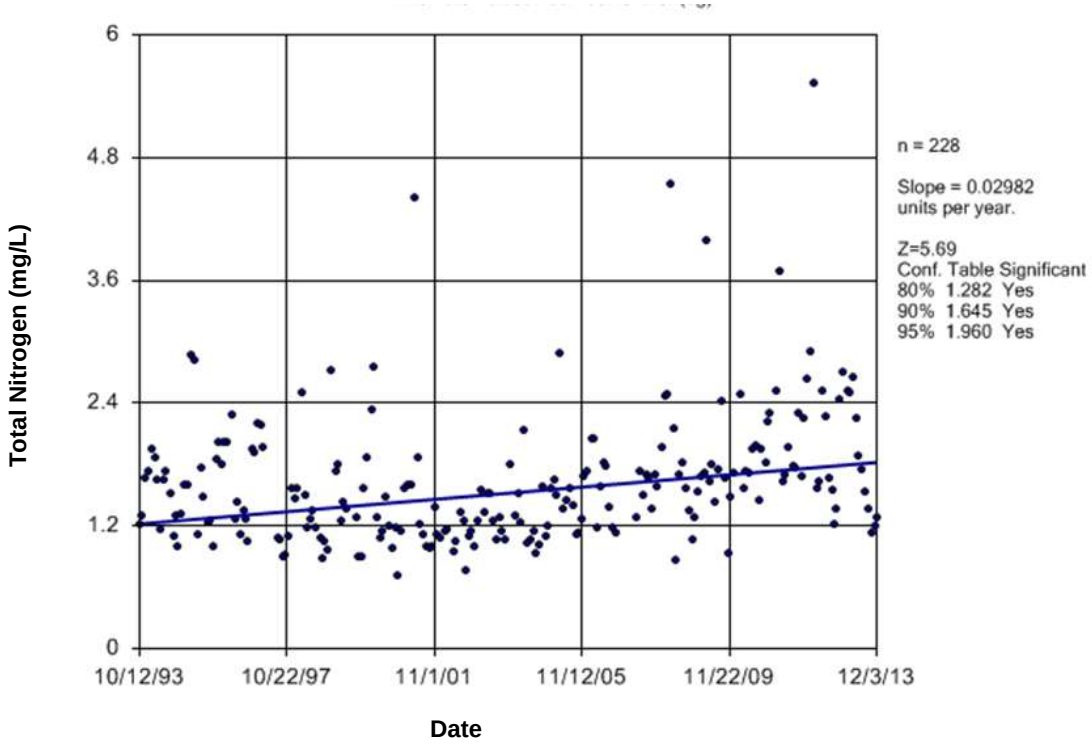


Figure B99 Assiniboine River: Total Nitrogen

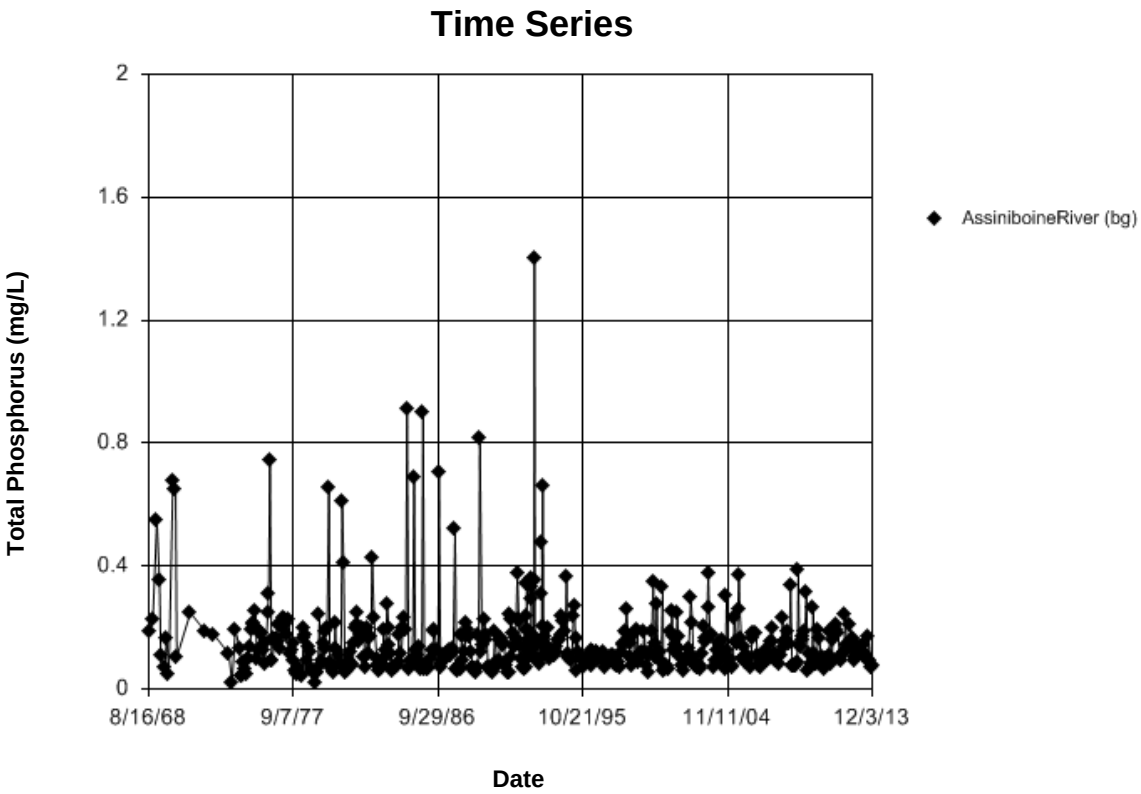


Figure B100 Assiniboine River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 103.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 31 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 103.7
Adjusted Kruskal-Wallis statistic (H') = 103.7

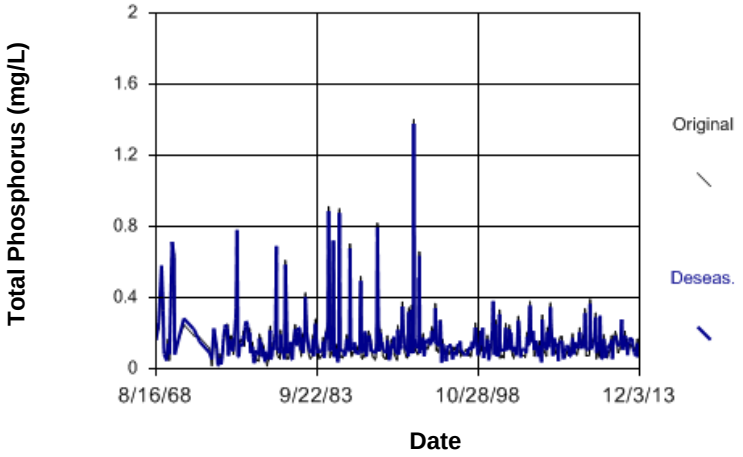


Figure B101 Assiniboine River: Total Phosphorus

Seasonal Kendall

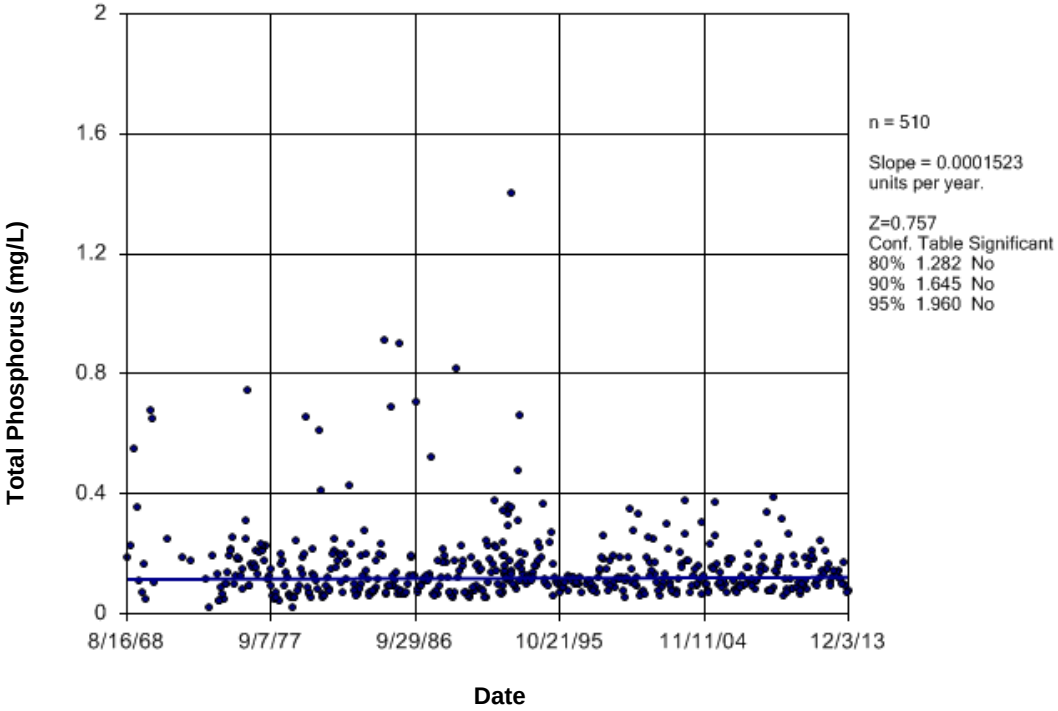


Figure B102 Assiniboine River: Total Phosphorus

Time Series

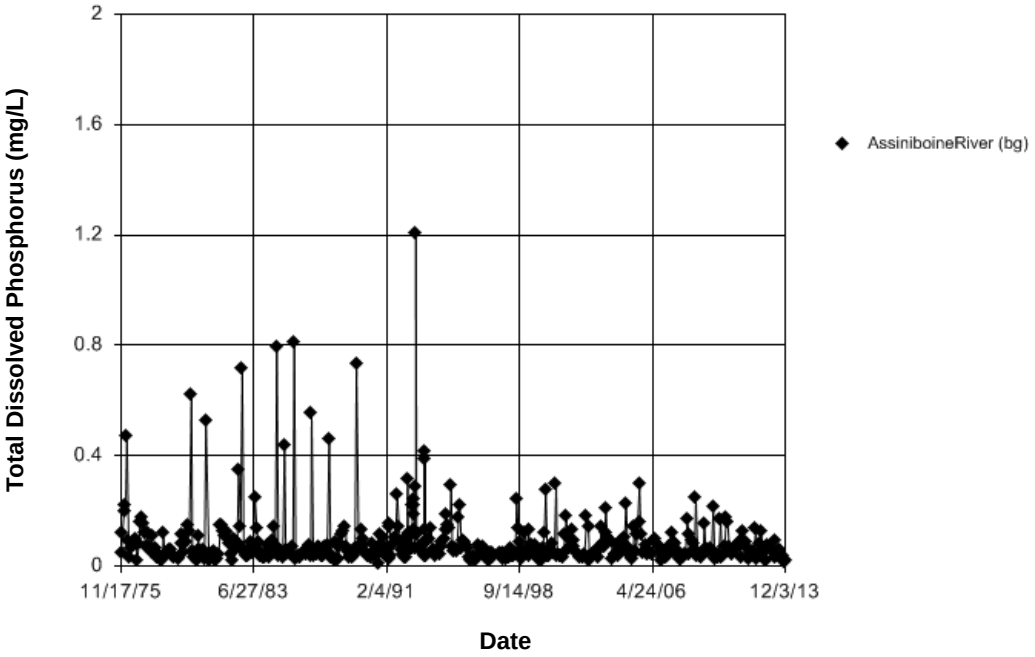


Figure B103 Assiniboine River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 74.9
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 13 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 74.9
Adjusted Kruskal-Wallis statistic (H') = 74.9

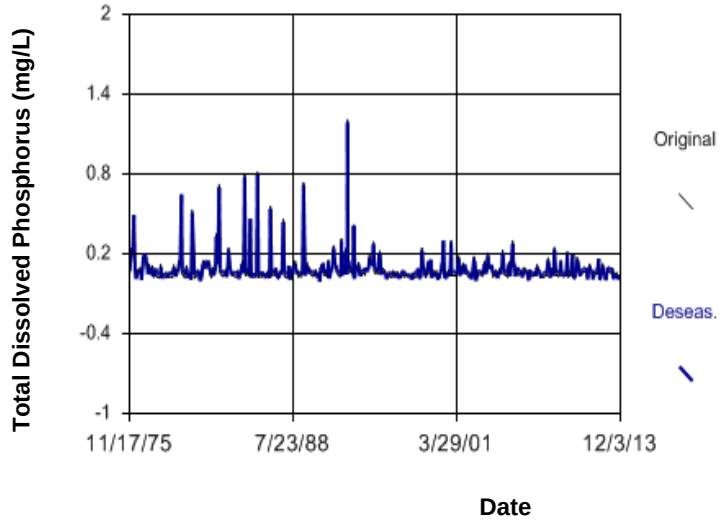


Figure B104 Assiniboine River: Total Dissolved Phosphorus

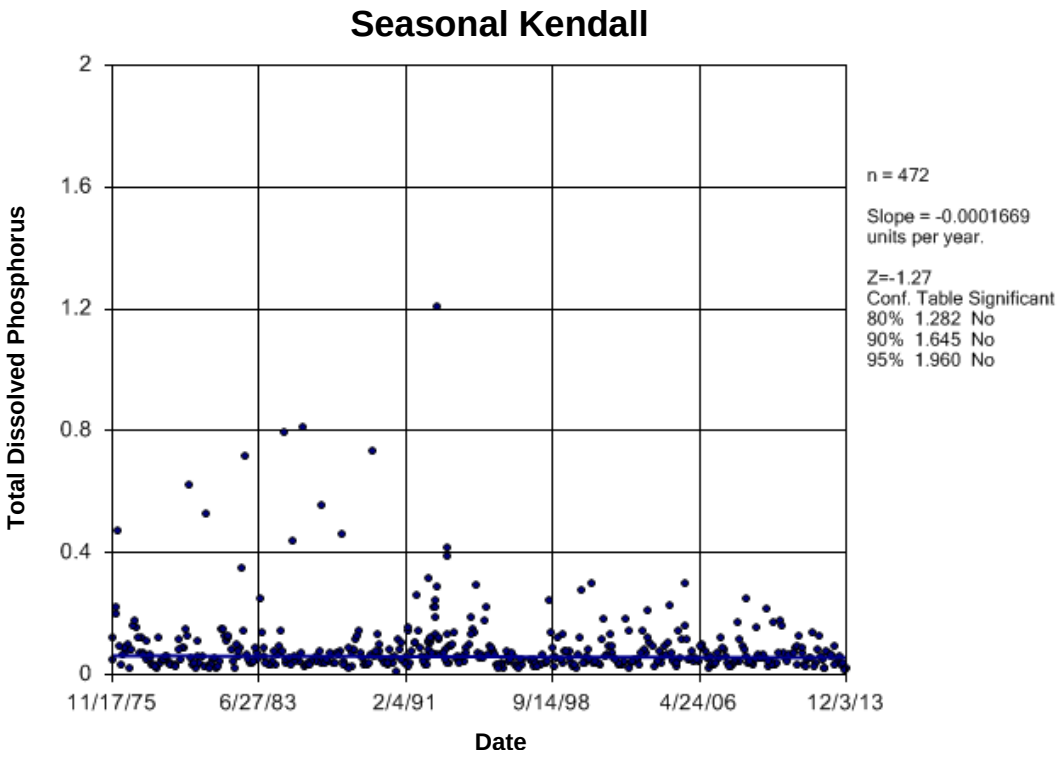


Figure B105 Assiniboine River: Total Dissolved Phosphorus

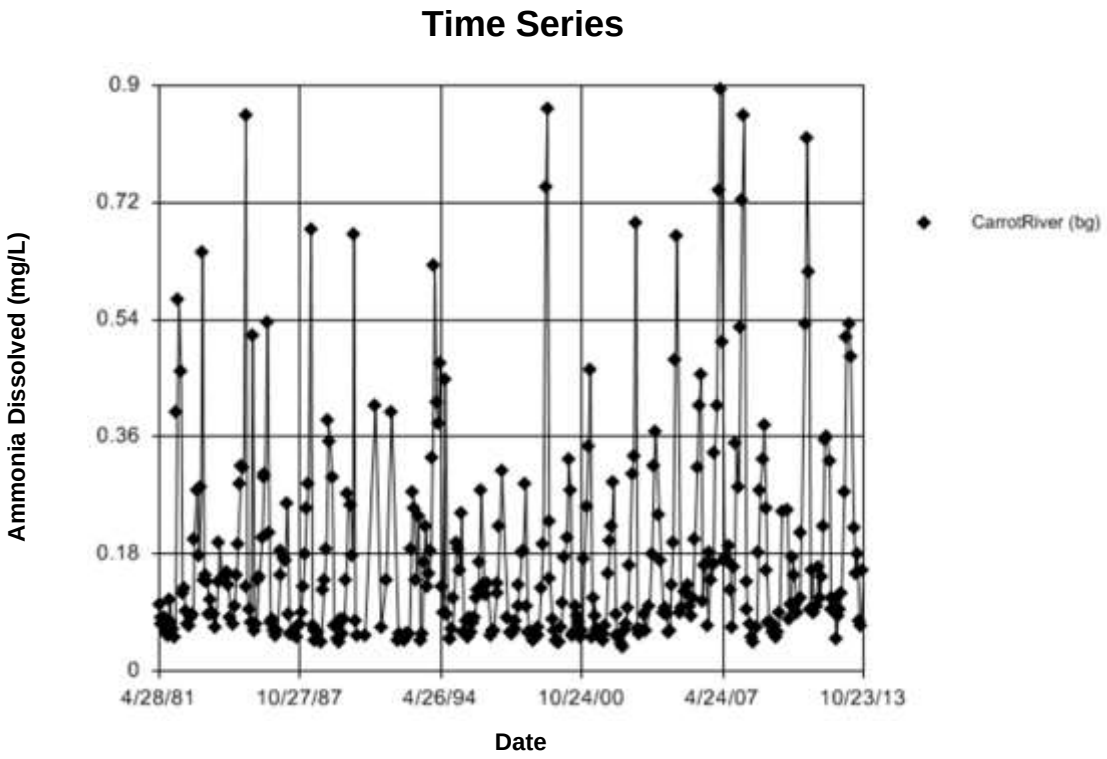


Figure B106 Carrot River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% signifIcance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we cooclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 145.6
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 145.6
Adjusted Kruskal-Wallis statistic (H') = 145.6

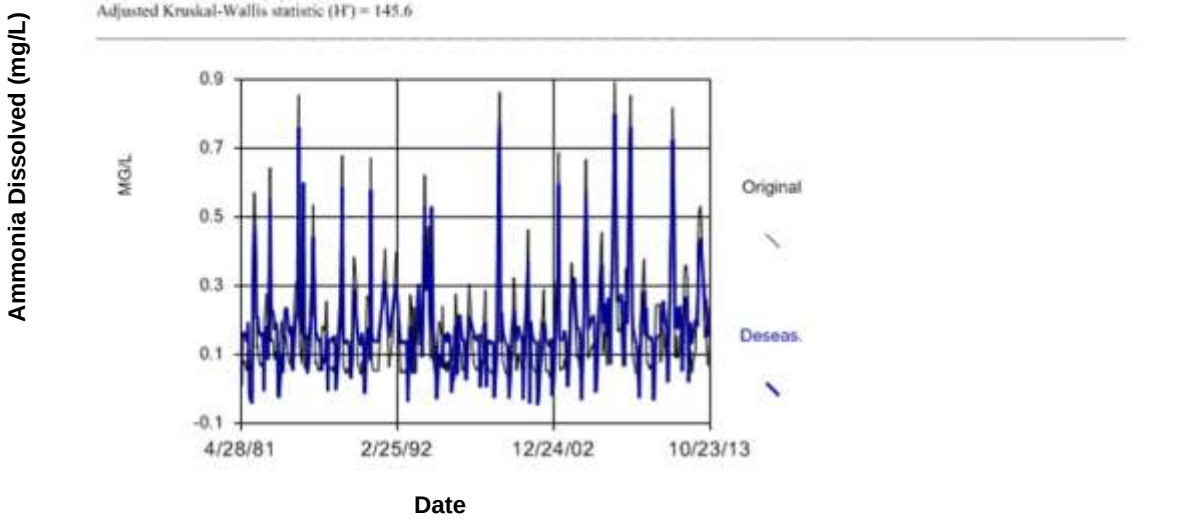


Figure B108 Carrot River: Ammonia Dissolved

Seasonal Kendall

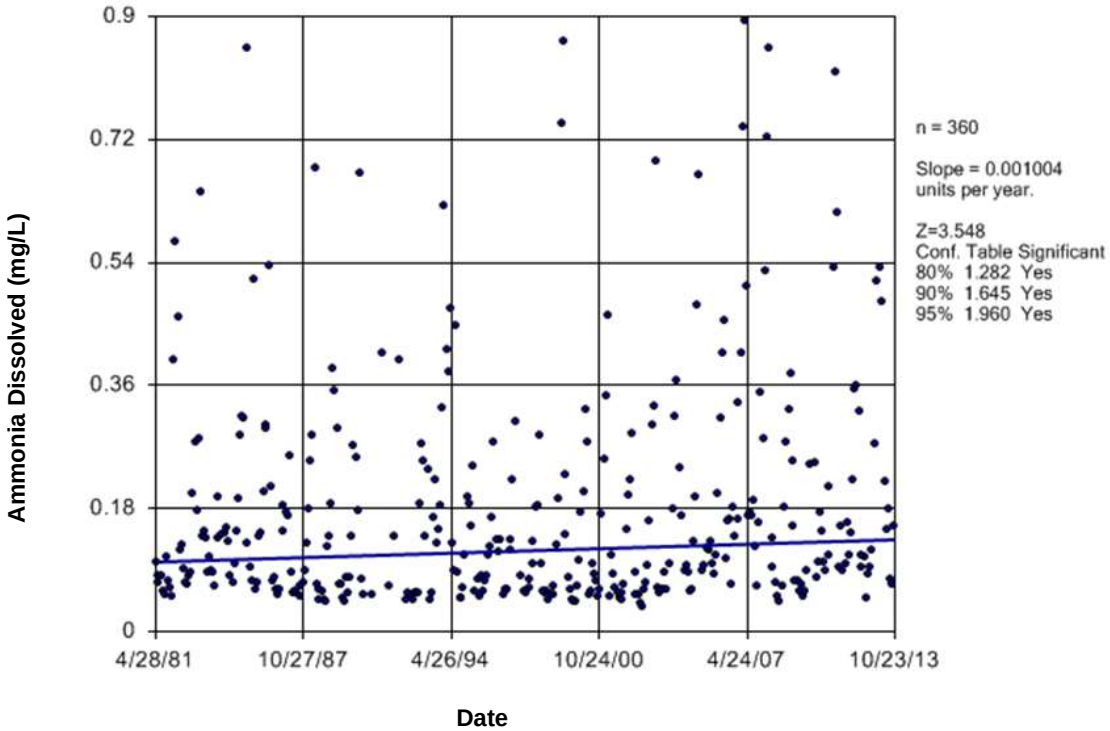


Figure B108 Carrot River: Ammonia Dissolved

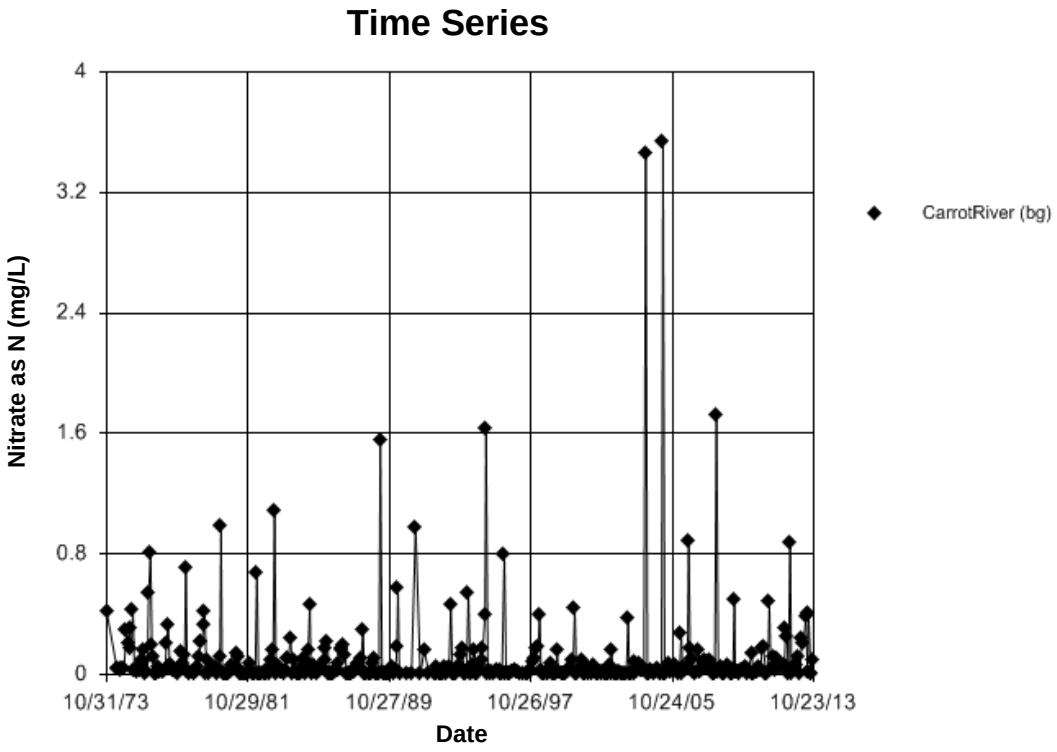


Figure B109 Carrot River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 20.2
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 20.2
Adjusted Kruskal-Wallis statistic (H') = 20.2

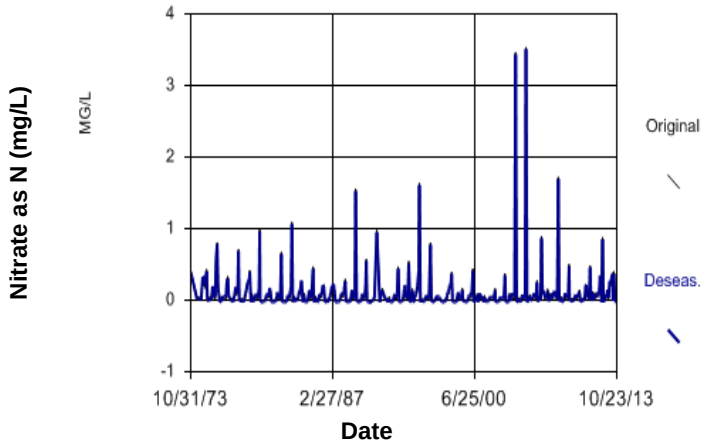


Figure B110 Carrot River: Nitrate as N

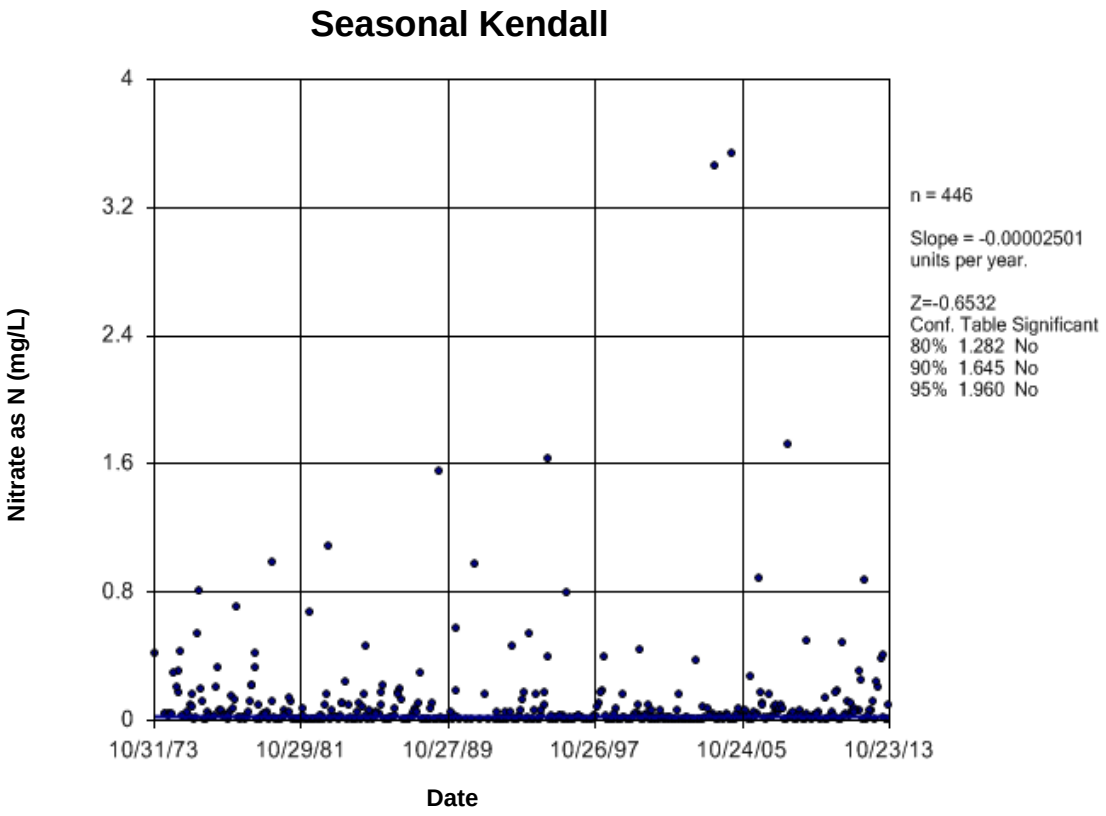


Figure B111 Carrot River: Nitrate as N

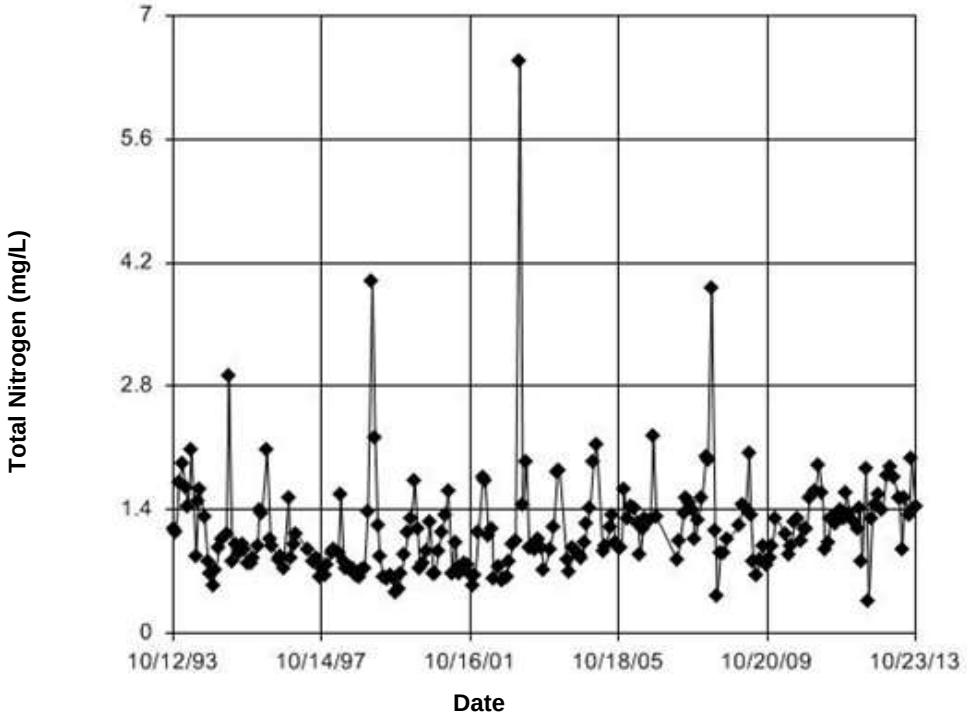


Figure B112 Carrot River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 32.33
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 32.33
Adjusted Kruskal-Wallis statistic (H') = 32.33

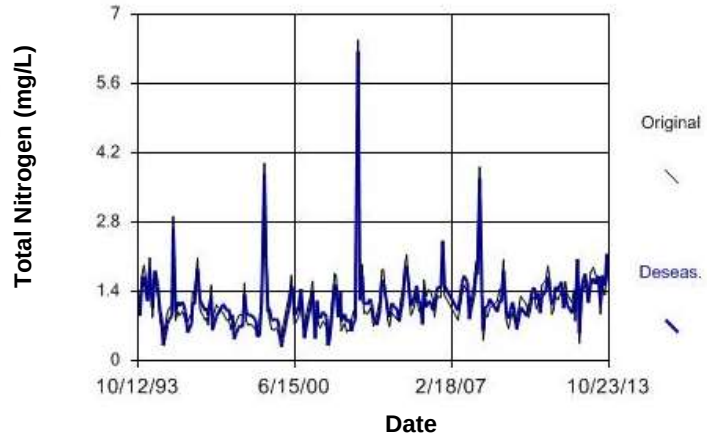


Figure B113 Carrot River: Total Nitrogen

Seasonal Kendall

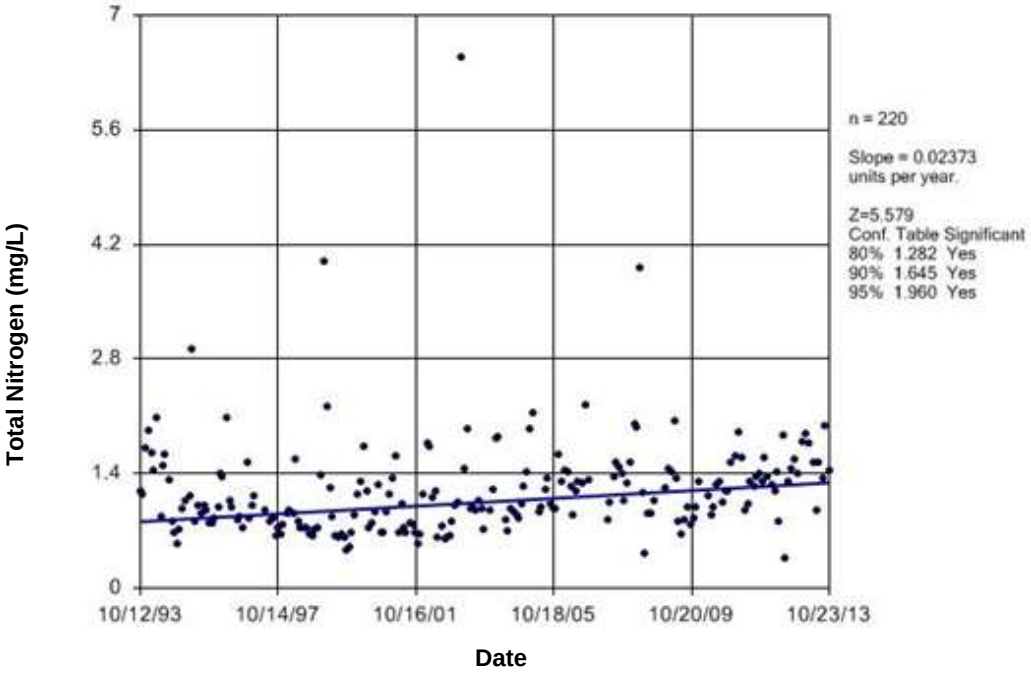


Figure B114 Carrot River: Total Nitrogen

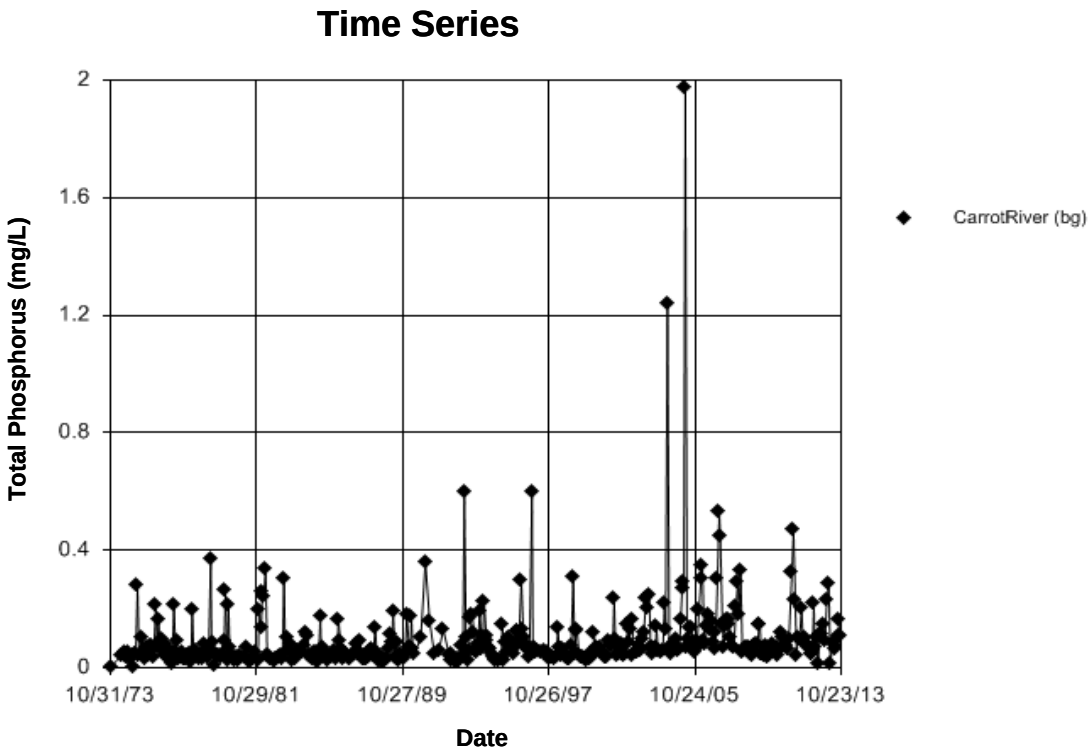


Figure B115 Carrot River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.628
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.628
Adjusted Kruskal-Wallis statistic (H') = 2.628

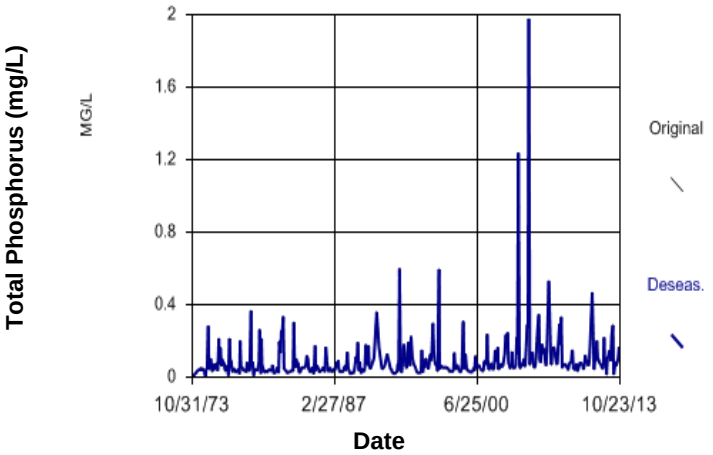


Figure B116 Carrot River: Total Phosphorus

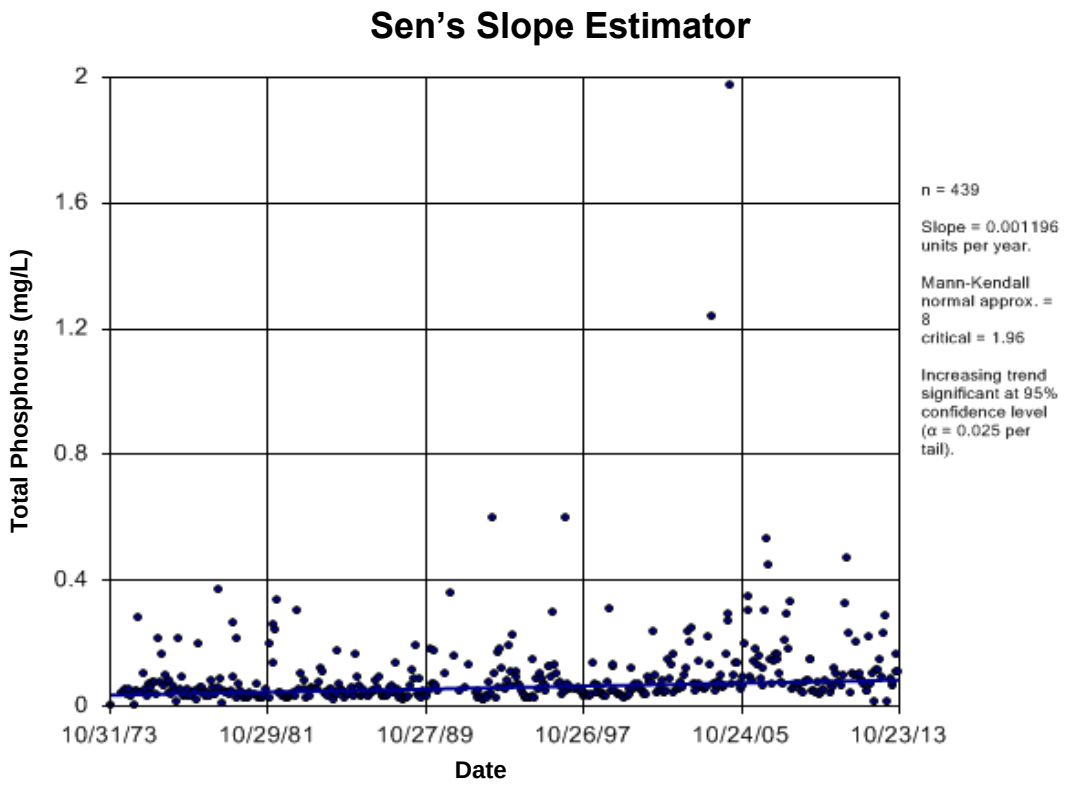


Figure B117 Carrot River: Total Phosphorus

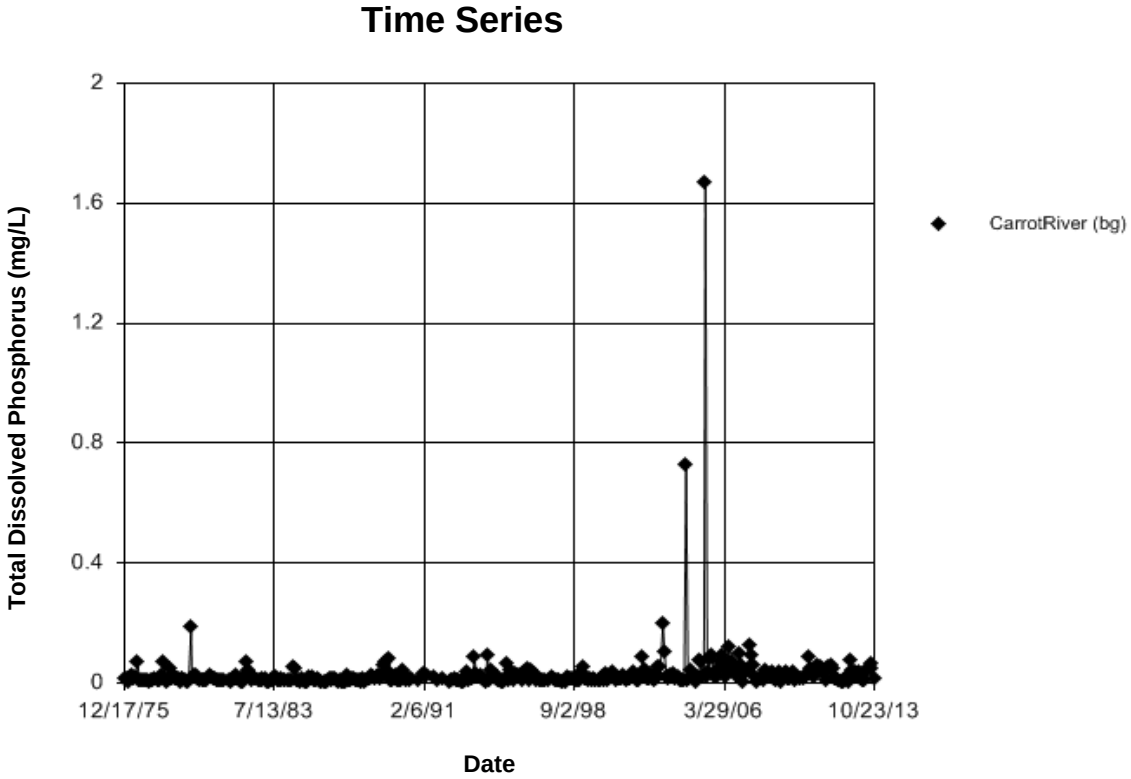


Figure B118 Carrot River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 21.21
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 13 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 21.21
Adjusted Kruskal-Wallis statistic (H') = 21.21

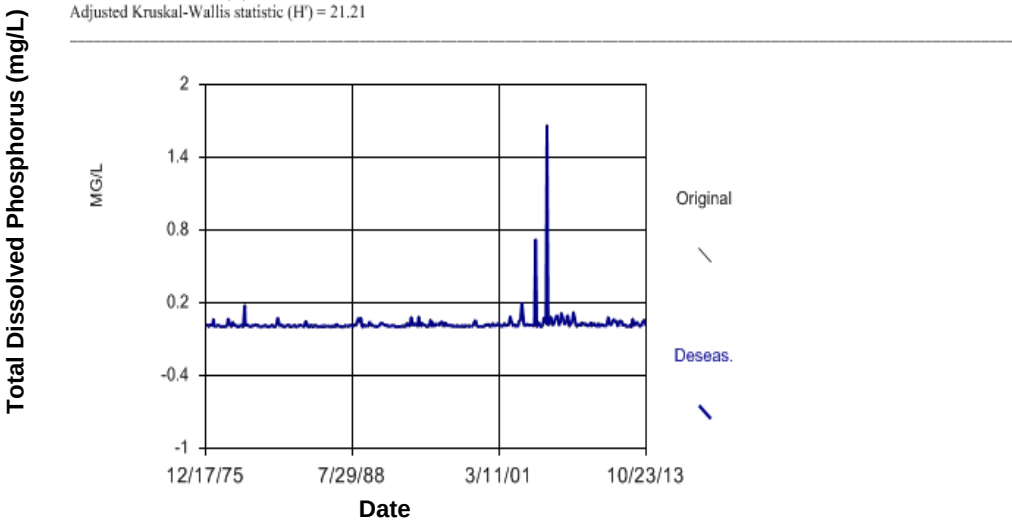


Figure B119 Carrot River: Total Dissolved Phosphorus

Seasonal Kendall

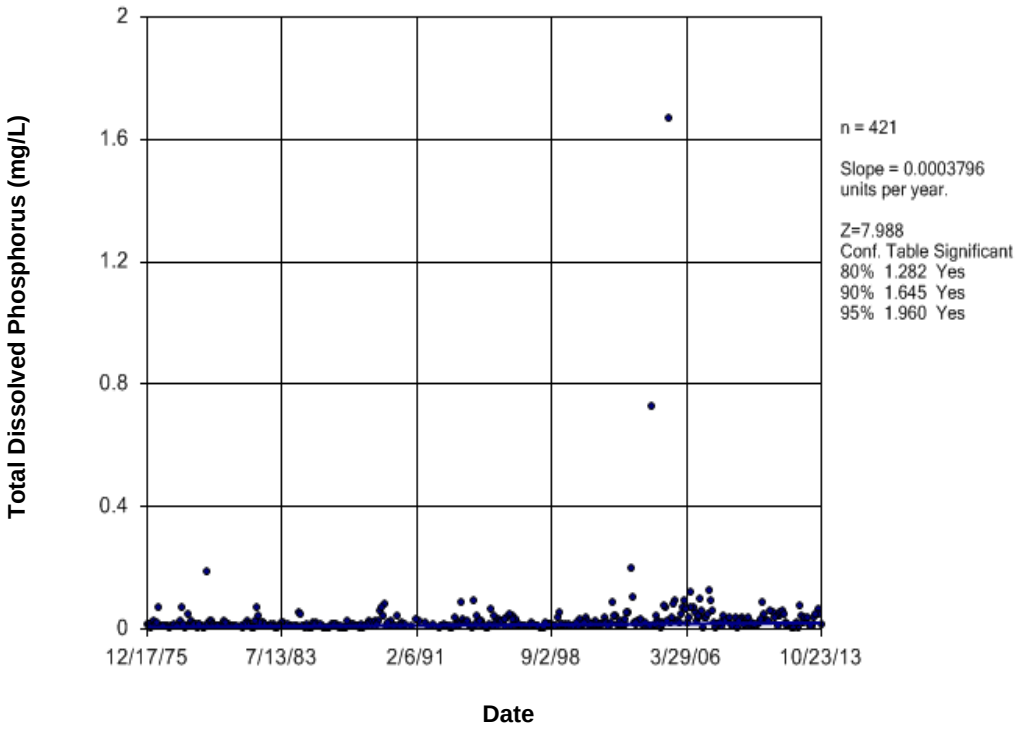


Figure B120 Carrot River: Total Dissolved Phosphorus

Time Series

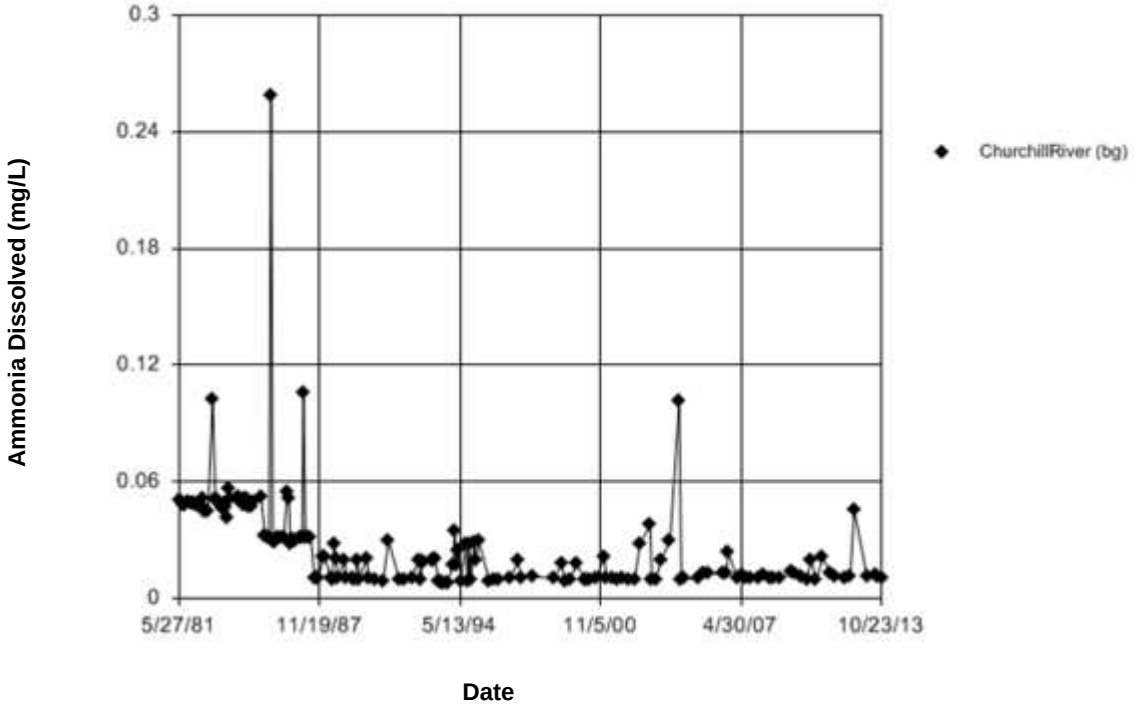


Figure B121 Churchill River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.529
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.529
Adjusted Kruskal-Wallis statistic (H') = 2.529

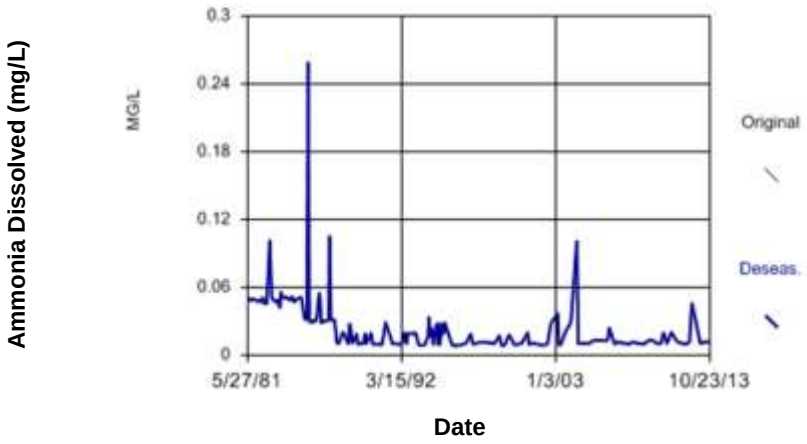


Figure B122 Churchill River: Ammonia Dissolved

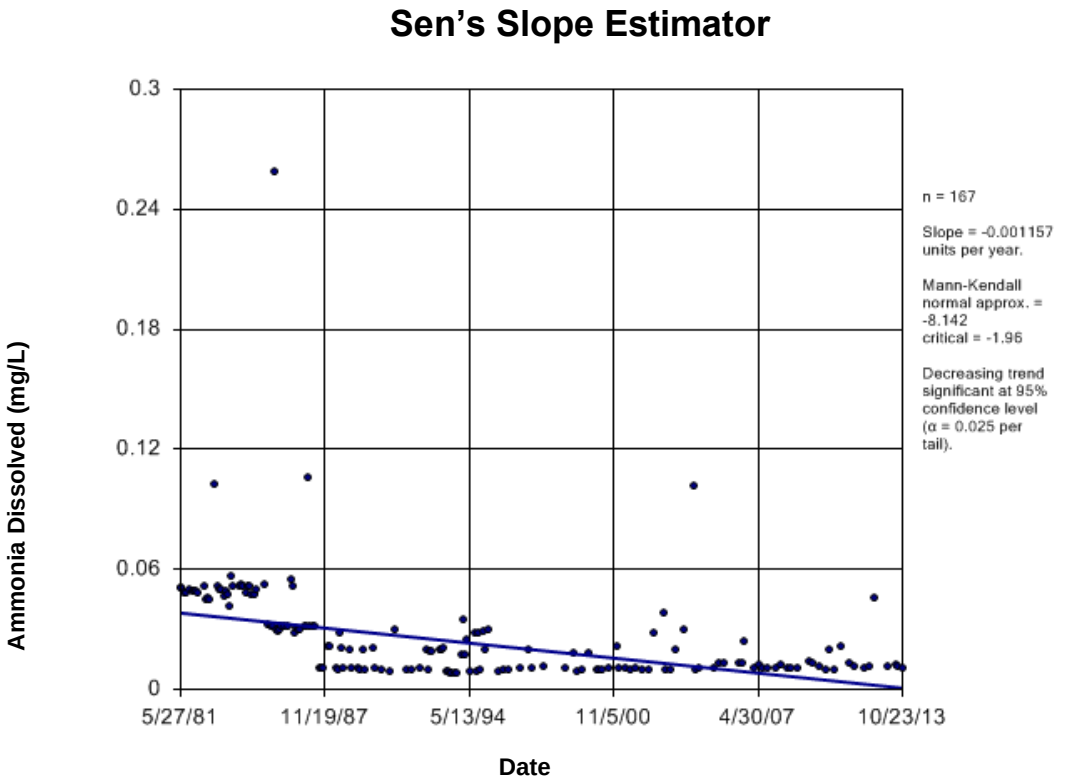


Figure B123 Churchill River: Ammonia Dissolved

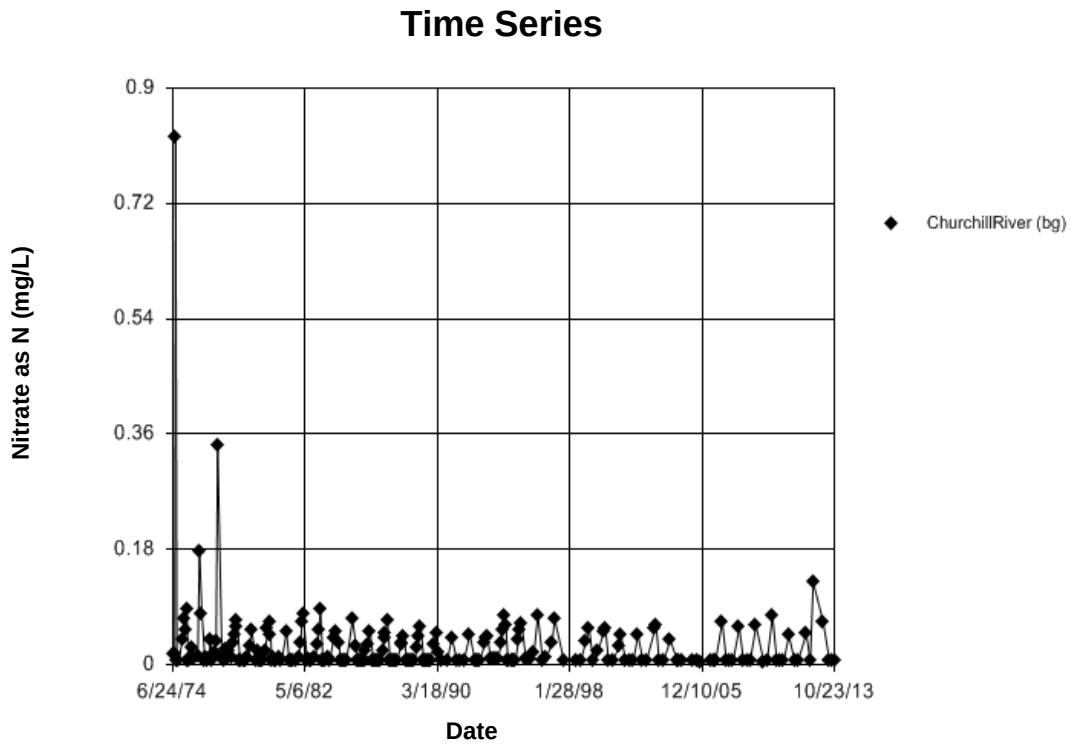


Figure B124 Churchill River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 135.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 18 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 135.7
Adjusted Kruskal-Wallis statistic (H') = 135.7

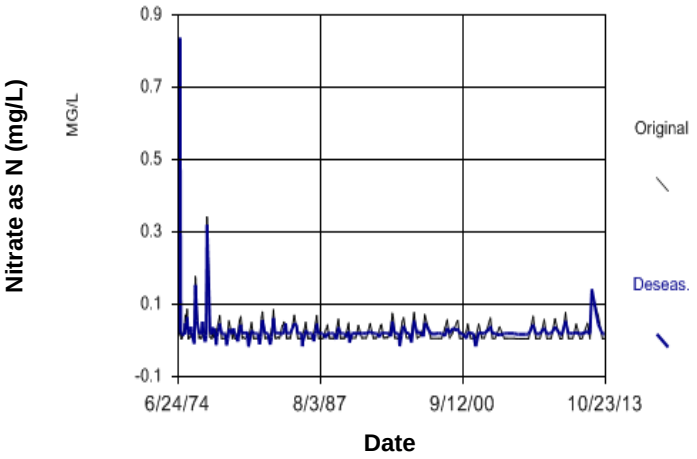


Figure B125 Churchill River: Nitrate as N

Seasonal Kendall

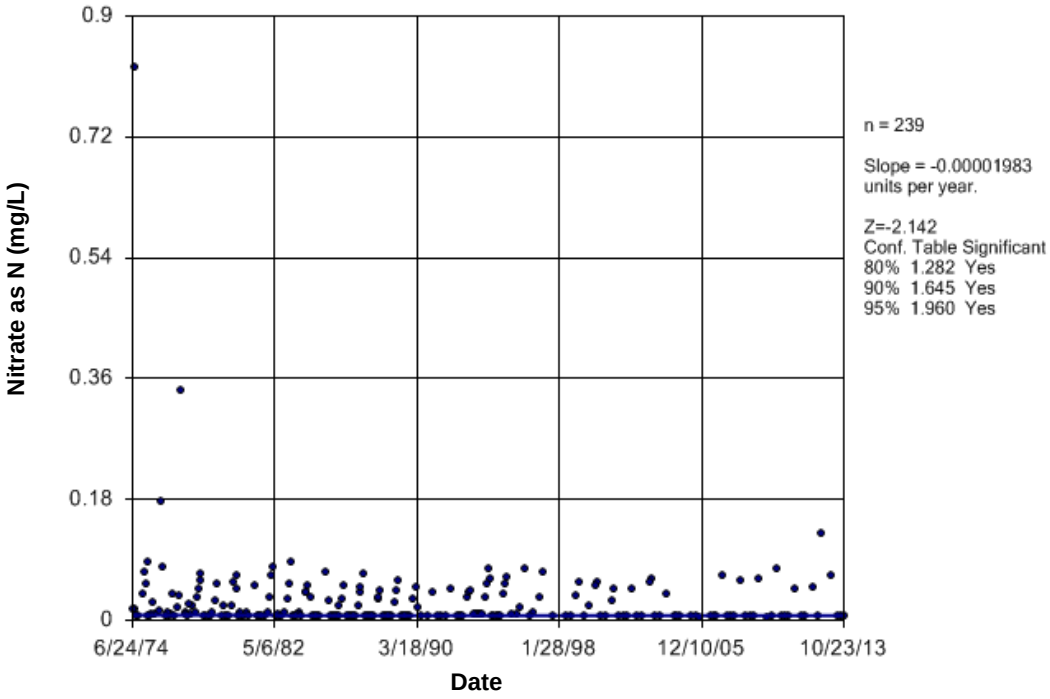


Figure B126 Churchill River: Nitrate as N

Time Series

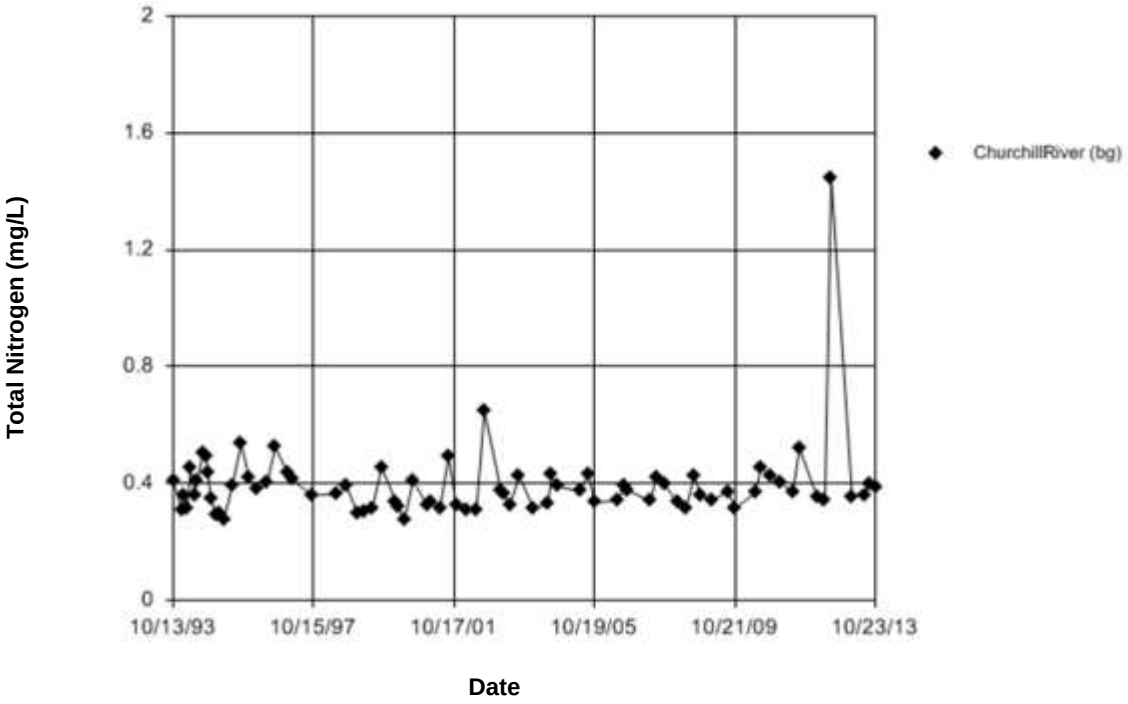


Figure B127 Churchill River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 12.91
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 12.91
Adjusted Kruskal-Wallis statistic (H') = 12.91

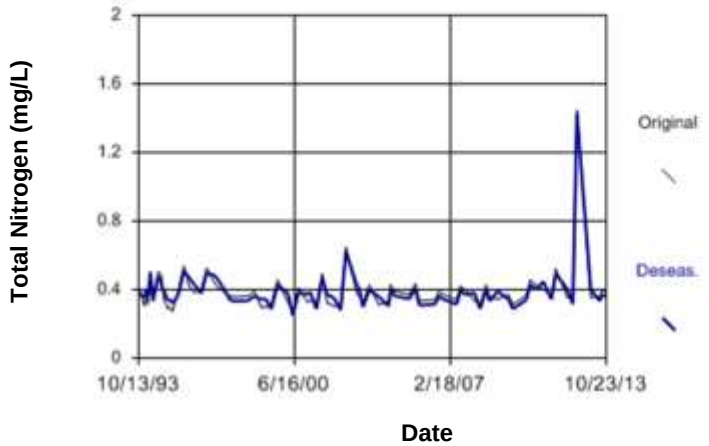


Figure B128 Churchill River: Total Nitrogen

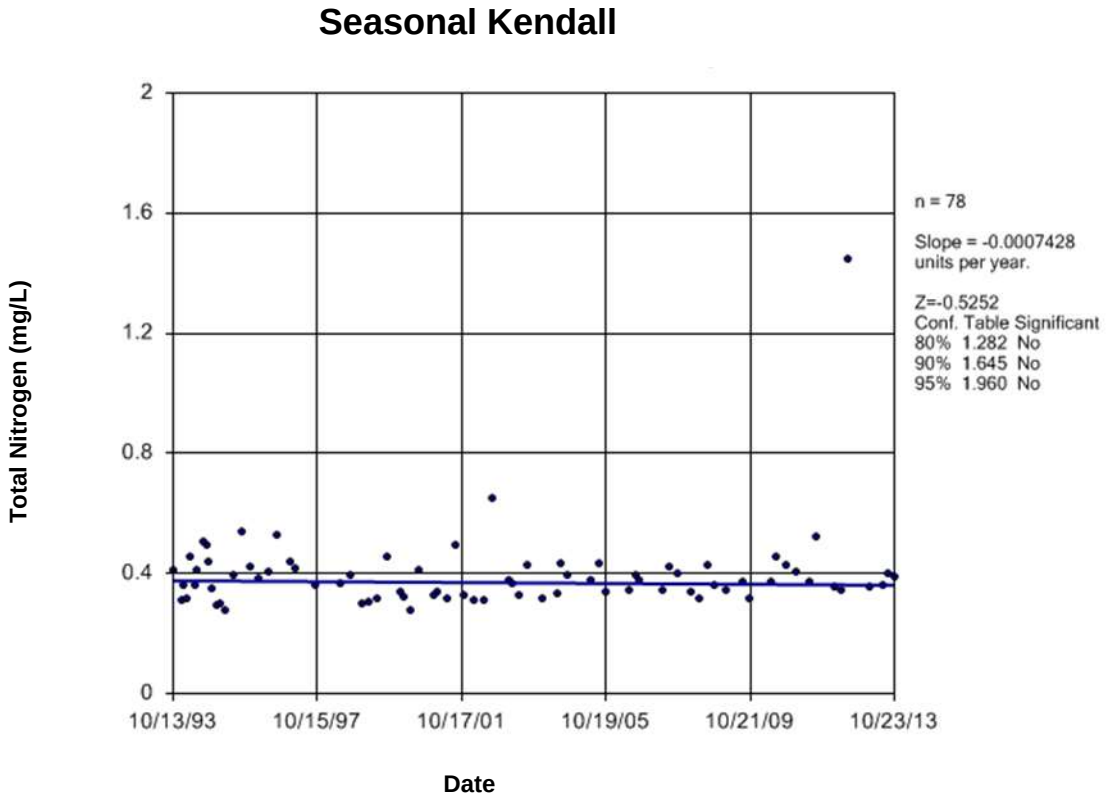


Figure B129 Churchill River: Total Nitrogen

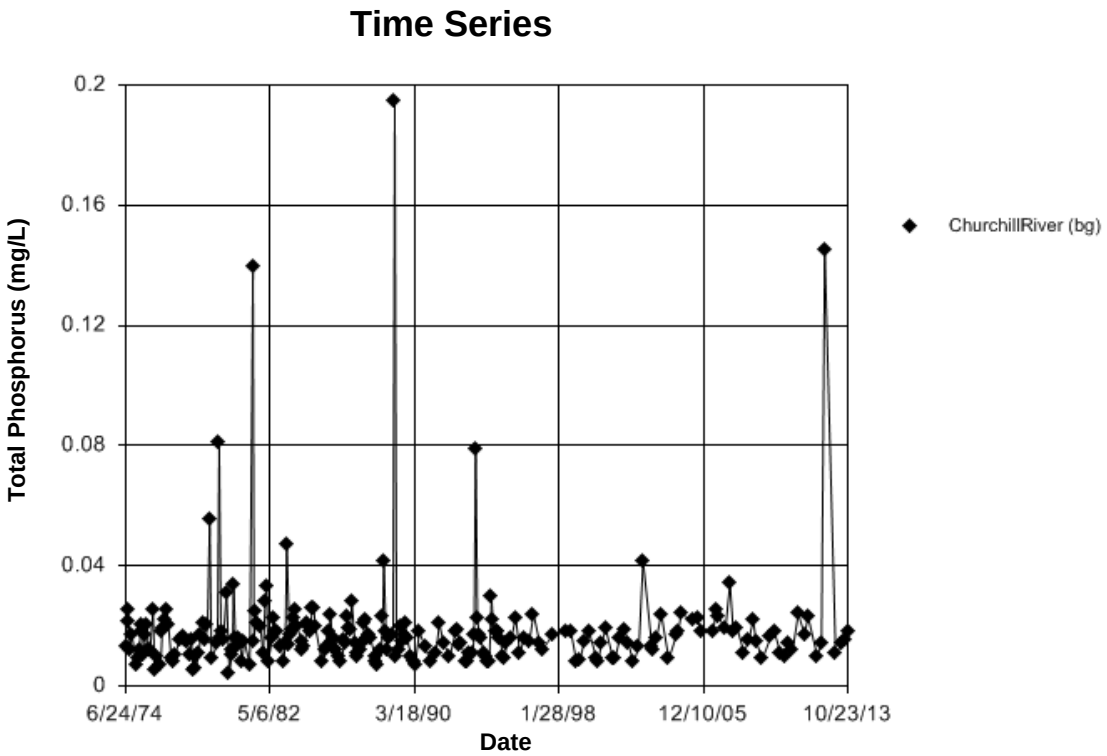


Figure B130 Churchill River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 76.87
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 28 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 76.87
Adjusted Kruskal-Wallis statistic (H') = 76.87

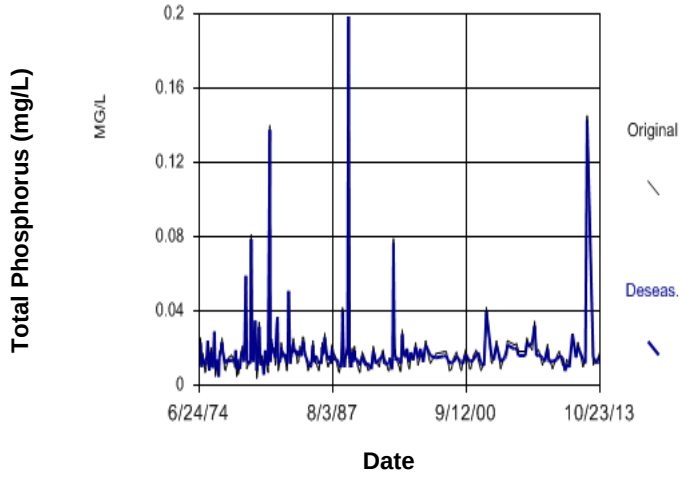


Figure B131 Churchill River: Total Phosphorus

Seasonal Kendall

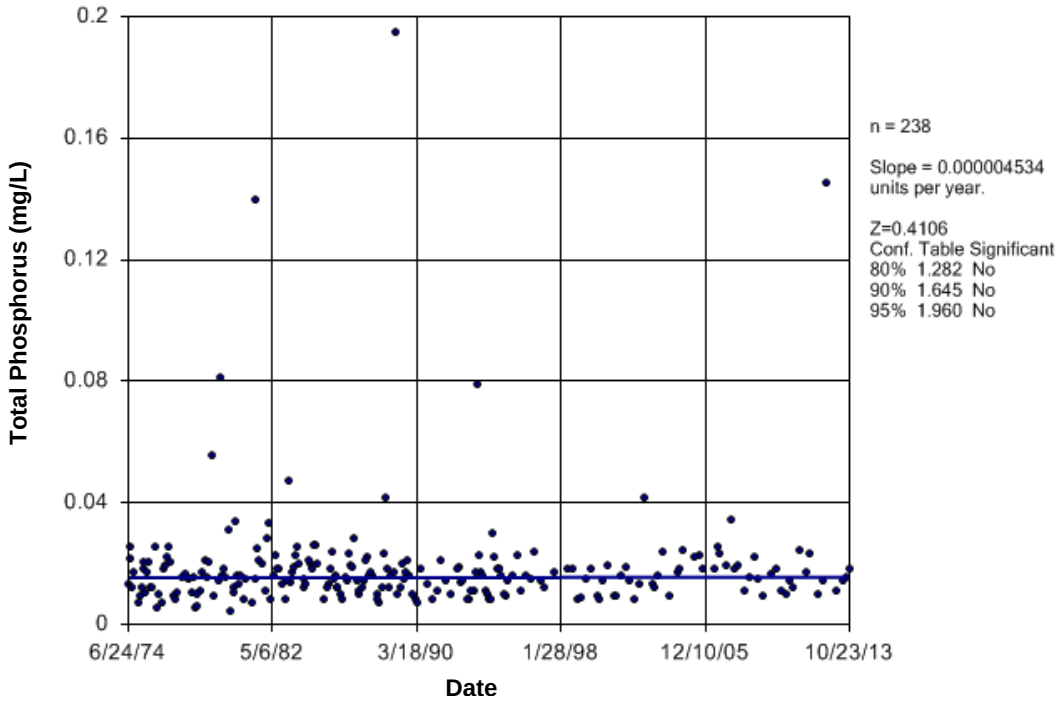


Figure B132 Churchill River: Total Phosphorus

Time Series

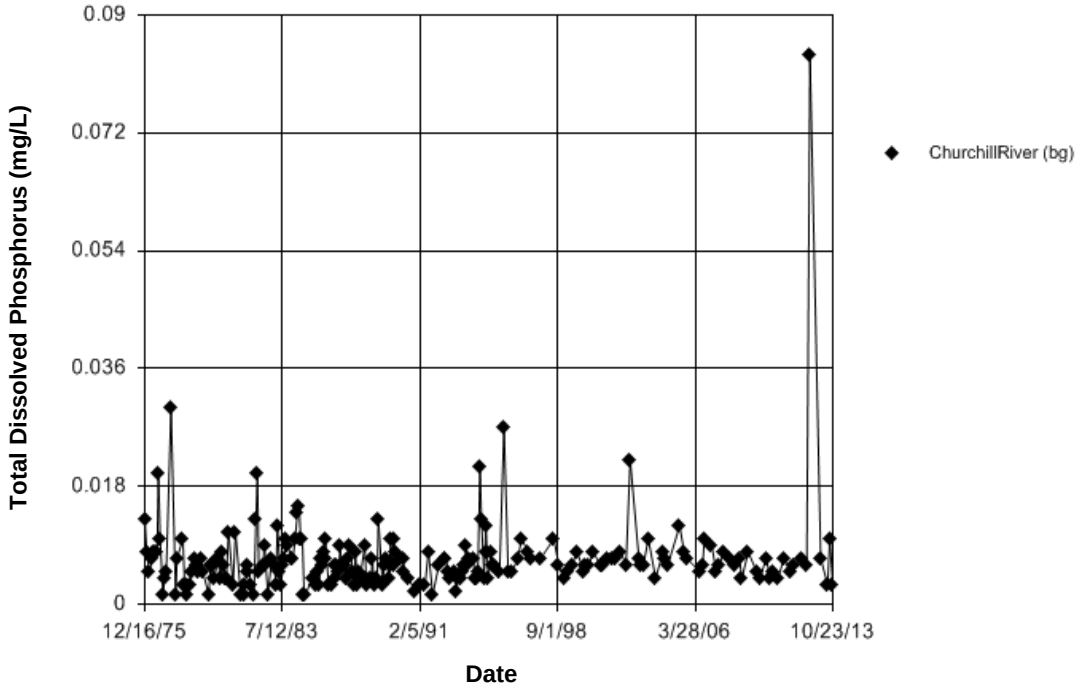


Figure B133 Churchill River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7116
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 54 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7115
Adjusted Kruskal-Wallis statistic (H') = 0.7116

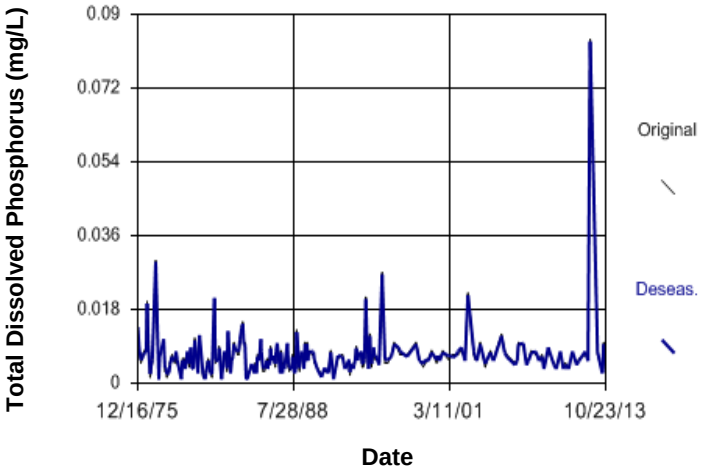


Figure B134 Churchill River: Total Dissolved Phosphorus

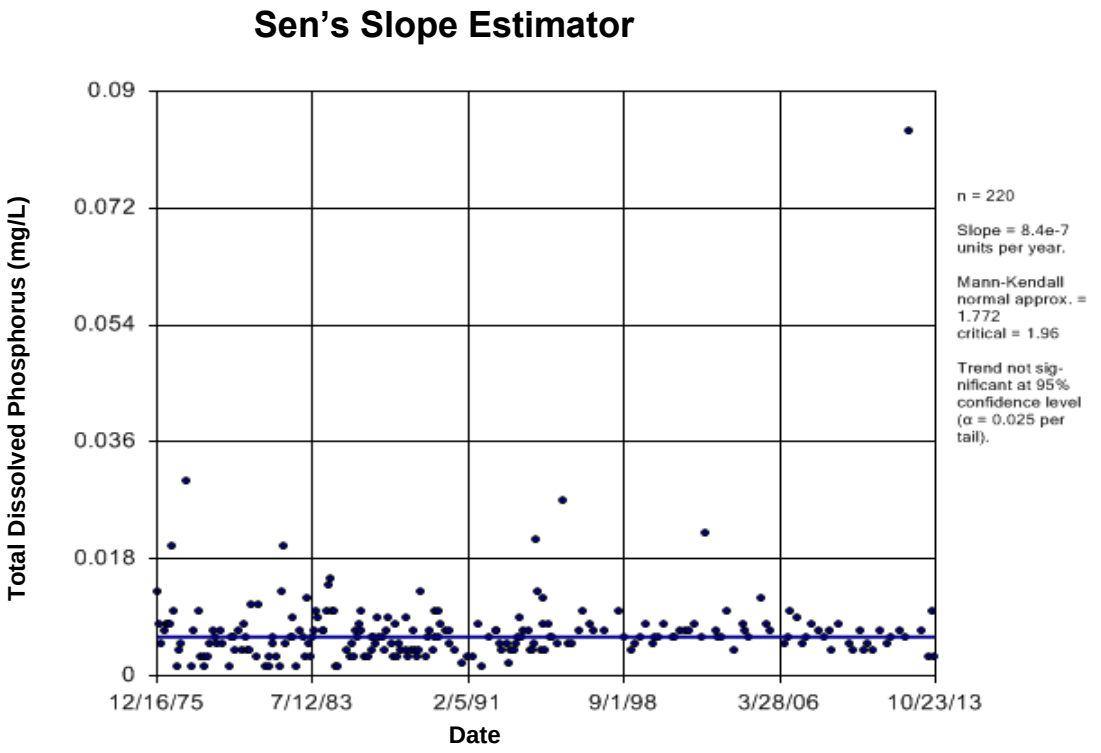


Figure B135 Churchill River: Total Dissolved Phosphorus

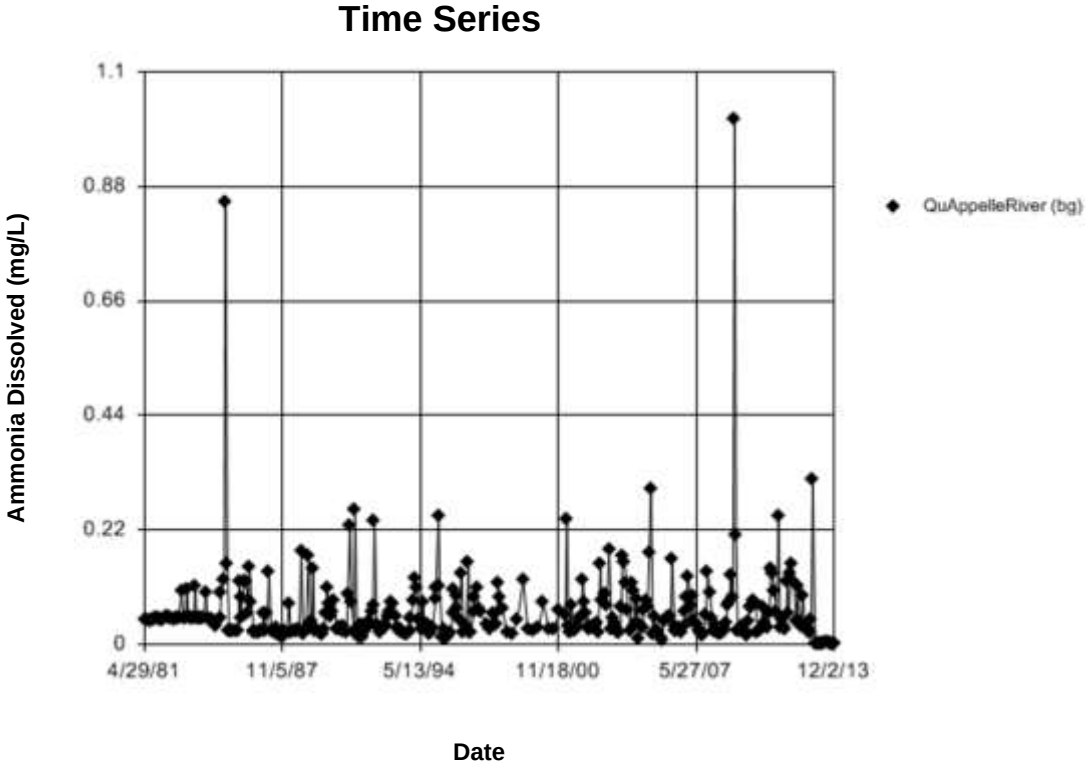


Figure B136 Qu'Appelle River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 116
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 11 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 116
Adjusted Kruskal-Wallis statistic (H') = 116

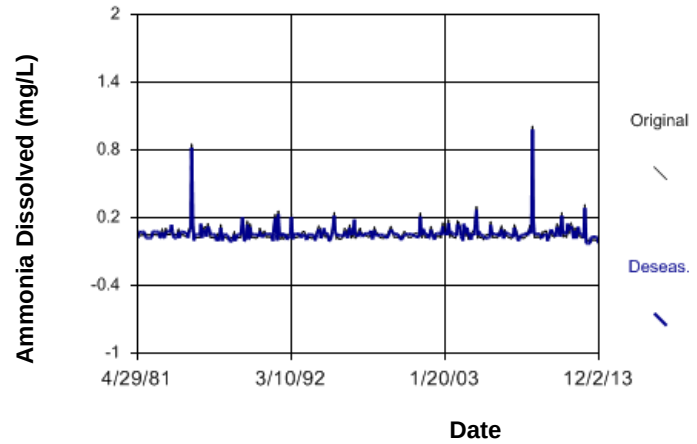


Figure B137 Qu'Appelle River: Ammonia Dissolved

Seasonal Kendall

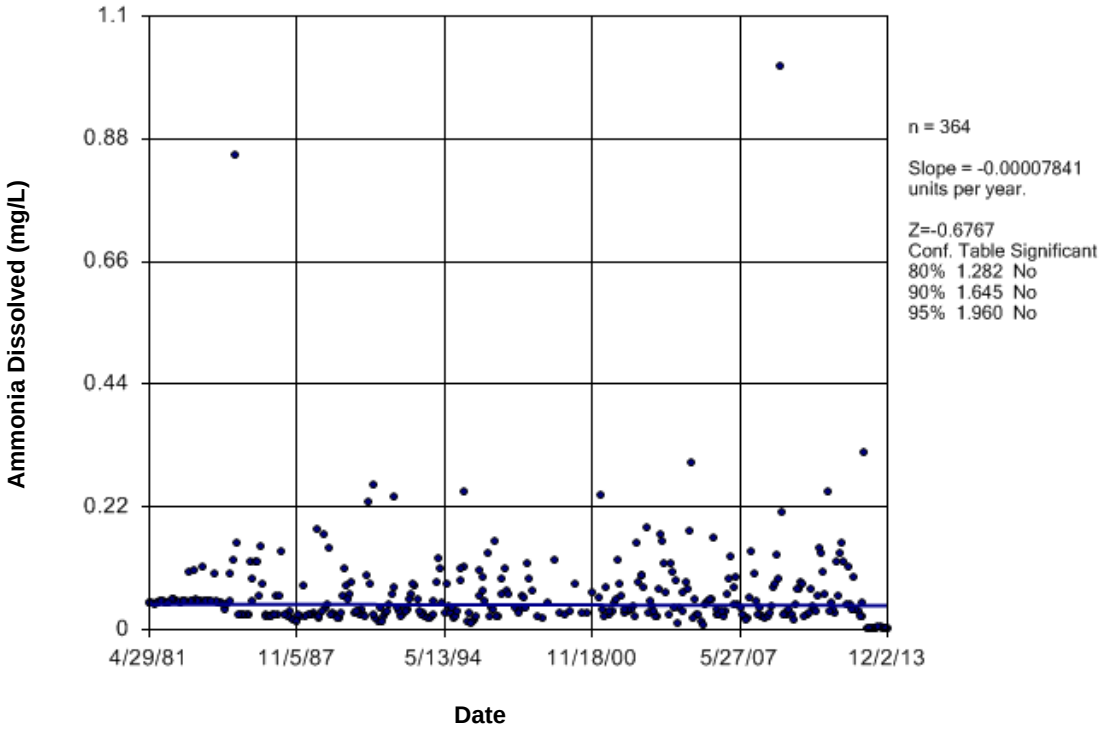


Figure B138 Qu'Appelle River: Ammonia Dissolved

Time Series

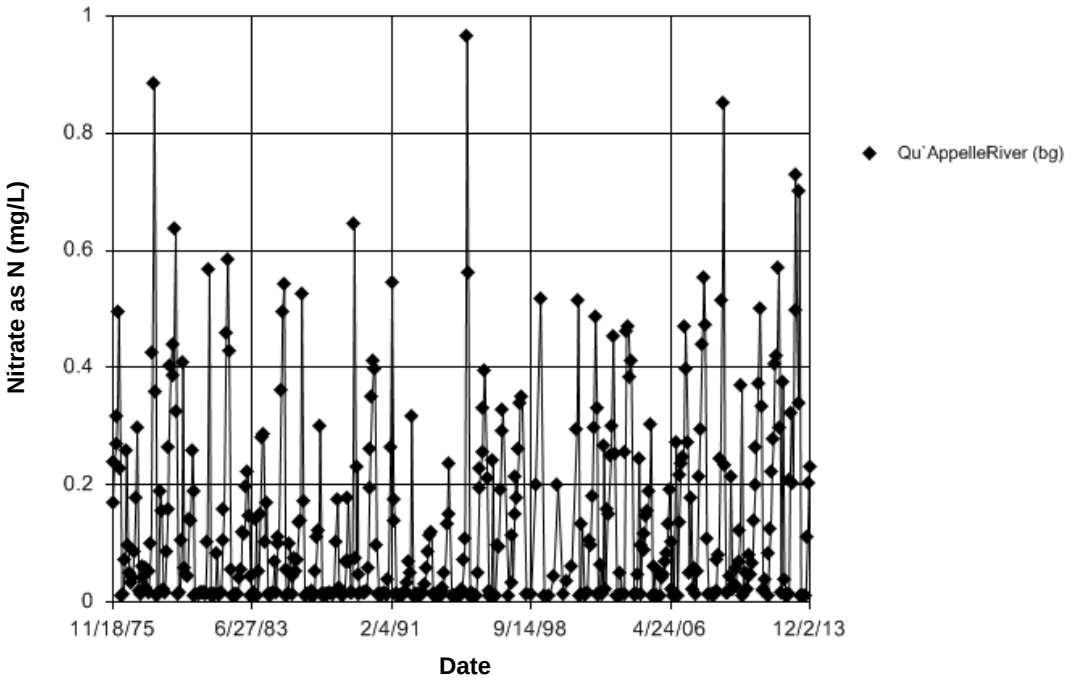


Figure B139 Qu'Appelle River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 151.2
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 21 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 151.2
Adjusted Kruskal-Wallis statistic (H') = 151.2

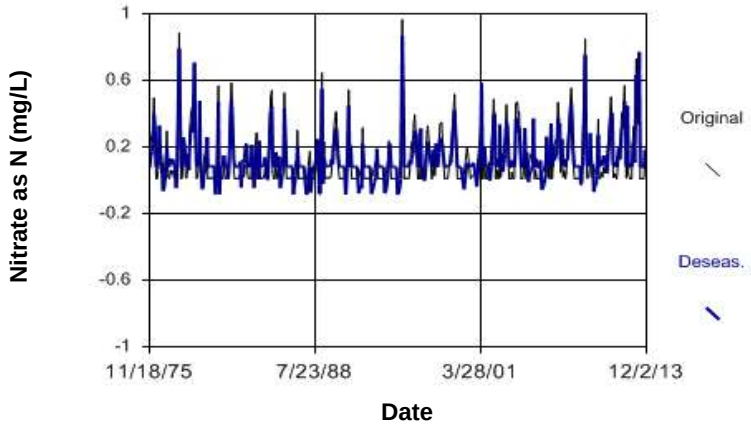


Figure B140 Qu'Appelle River: Nitrate as N

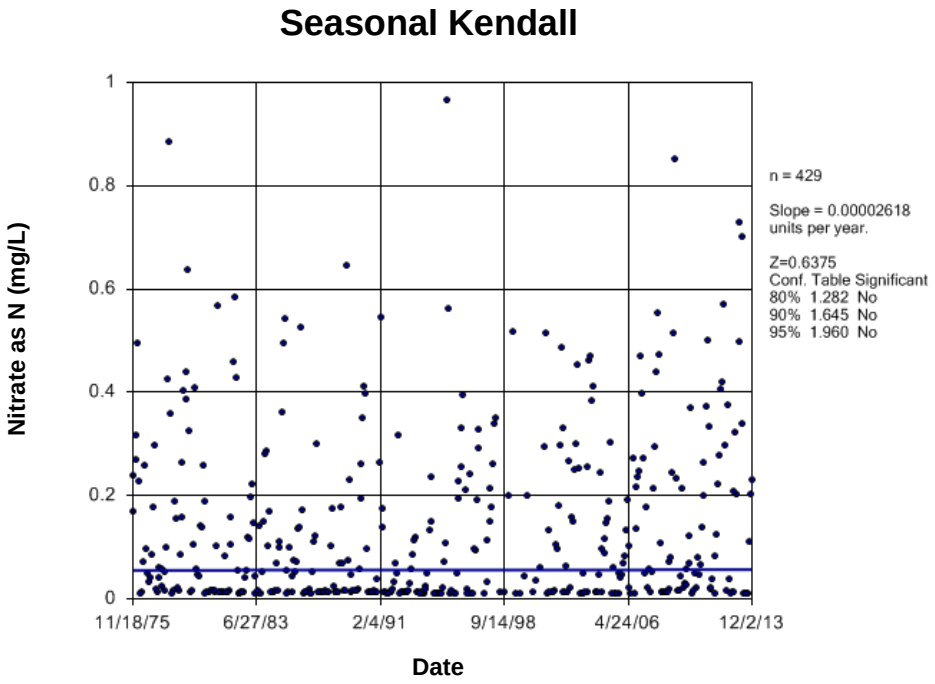


Figure B141 Qu'Appelle River: Nitrate as N

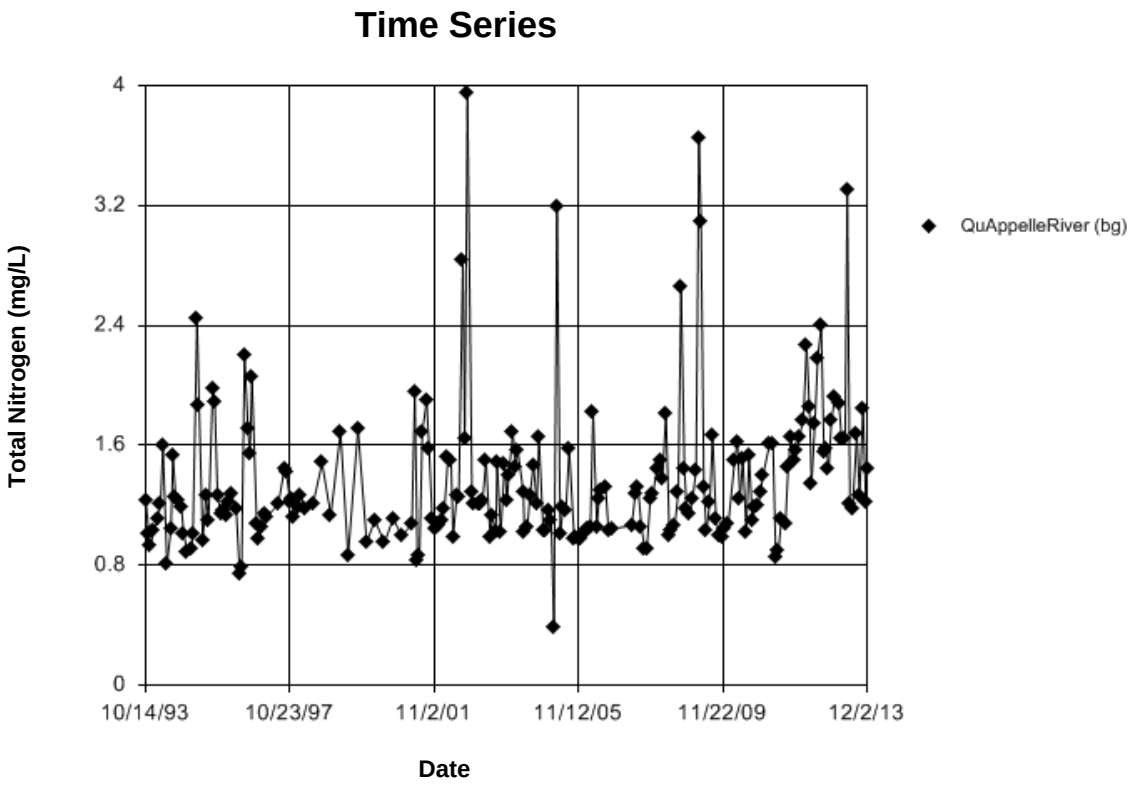


Figure B142 Qu'Appelle River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.2456
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 12 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.2456
Adjusted Kruskal-Wallis statistic (H') = 0.2456

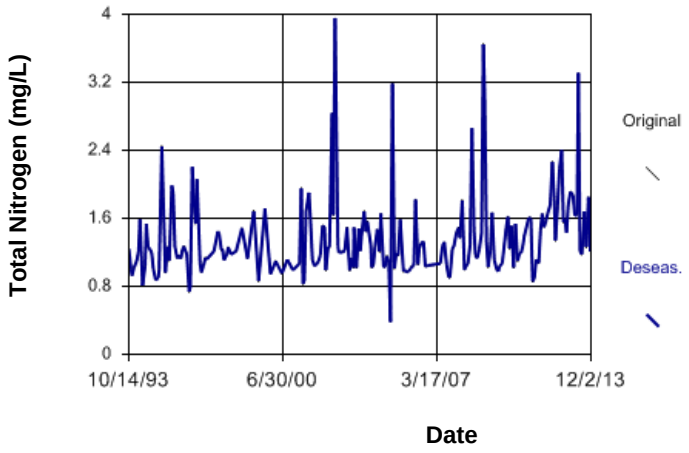


Figure B143 Qu'Appelle River: Total Nitrogen

Sen's Slope Estimator

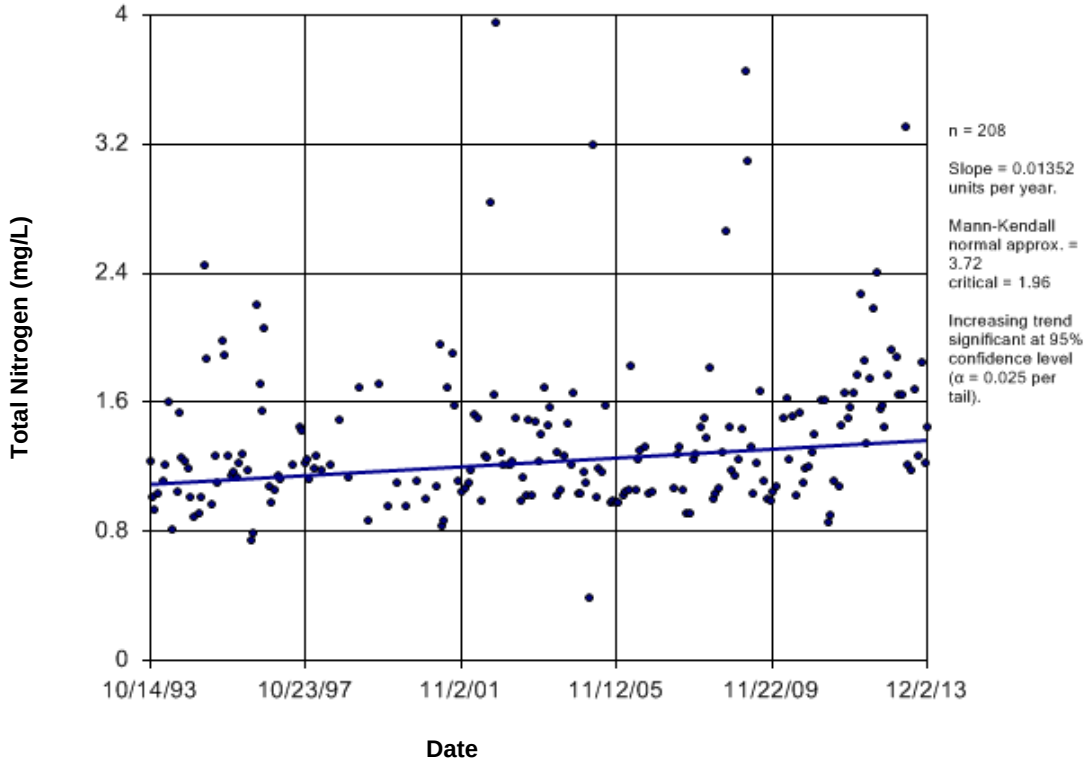


Figure B144 Qu'Appelle River: Total Nitrogen

Time Series

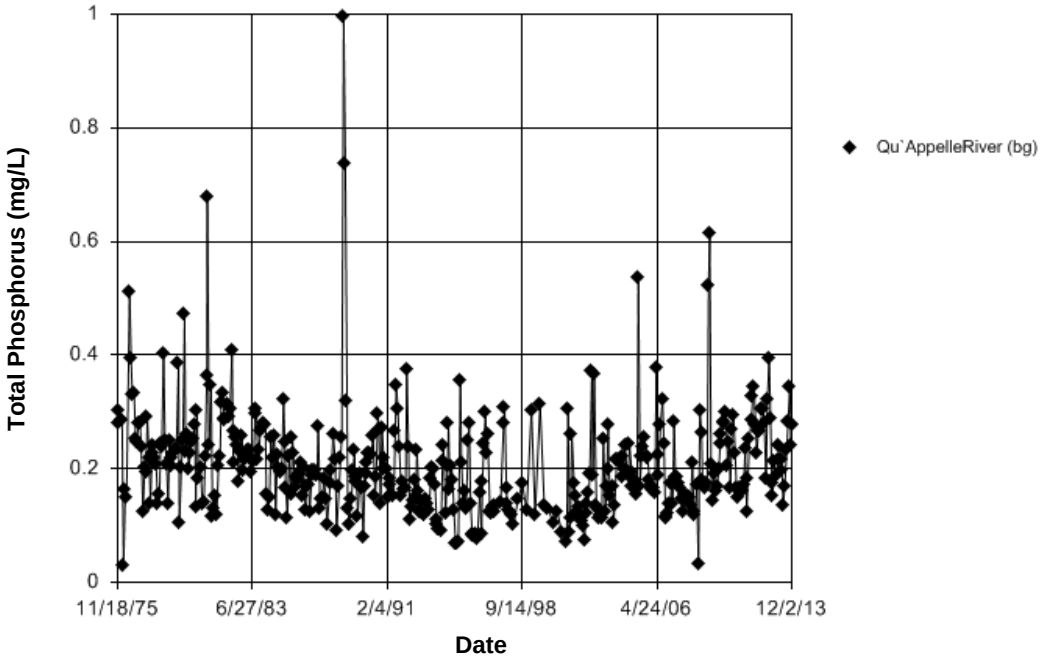


Figure B145 Qu'Appelle River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 7.46
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 33 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 7.46
Adjusted Kruskal-Wallis statistic (H') = 7.46

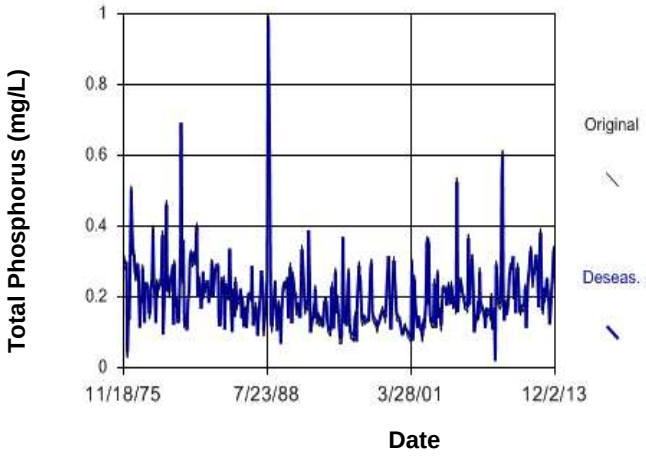


Figure B146 Qu'Appelle River: Total Phosphorus

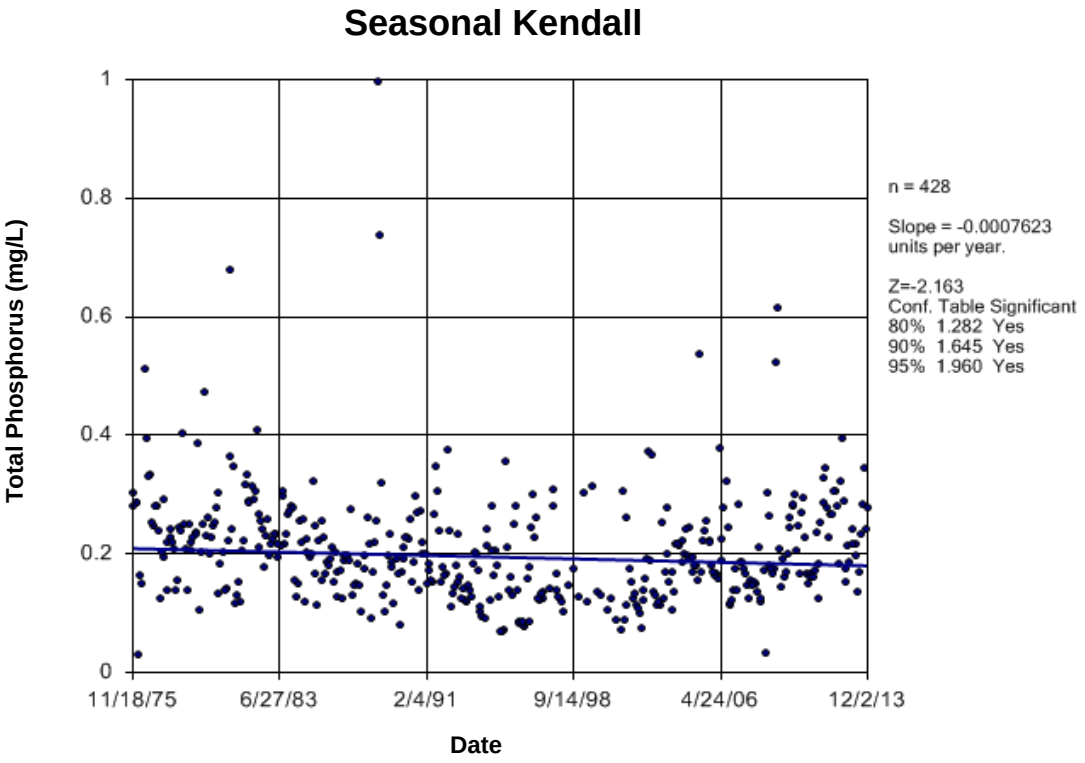


Figure B147 Qu'Appelle River: Total Phosphorus

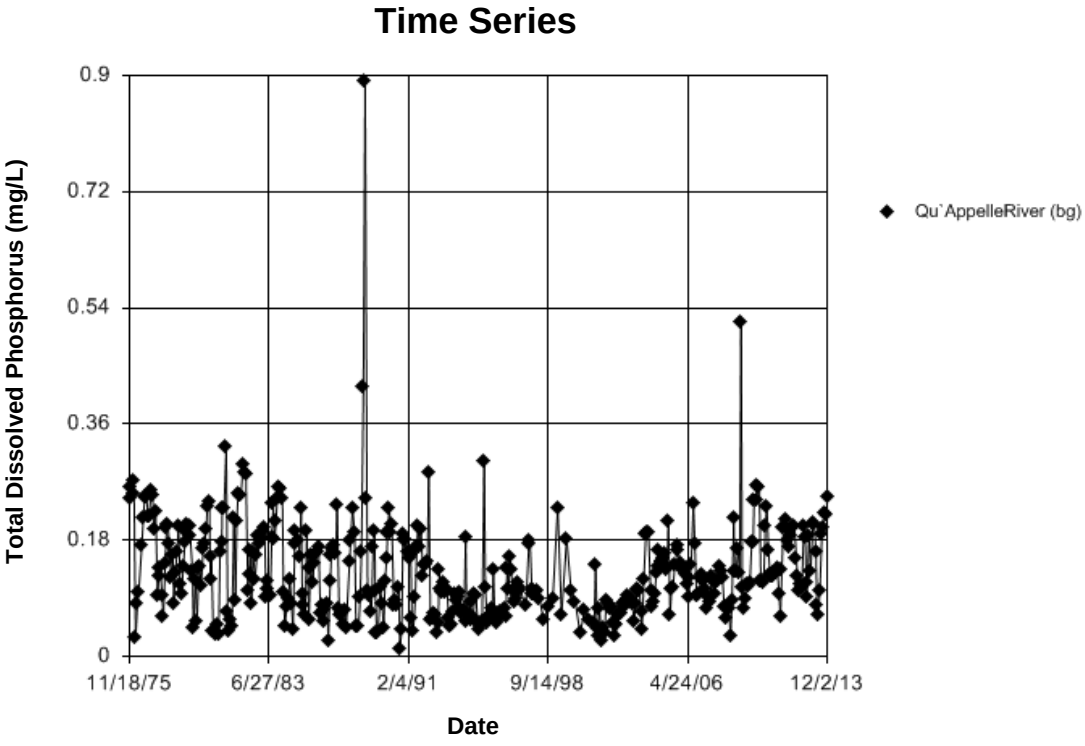


Figure B148 Qu'Appelle River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 59.59
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 31 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 59.59
Adjusted Kruskal-Wallis statistic (H') = 59.59

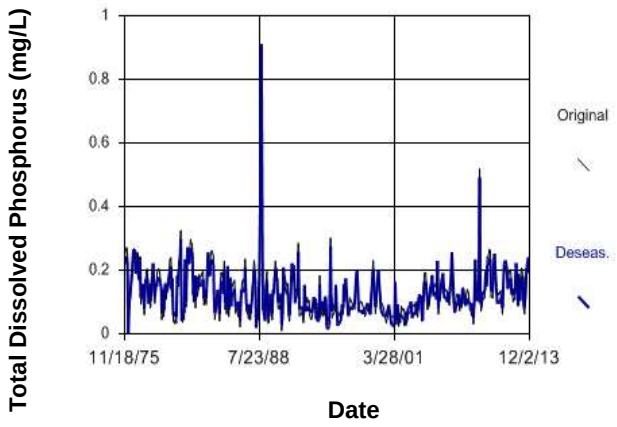


Figure B149 Qu'Appelle River: Total Dissolved Phosphorus

Seasonal Kendall

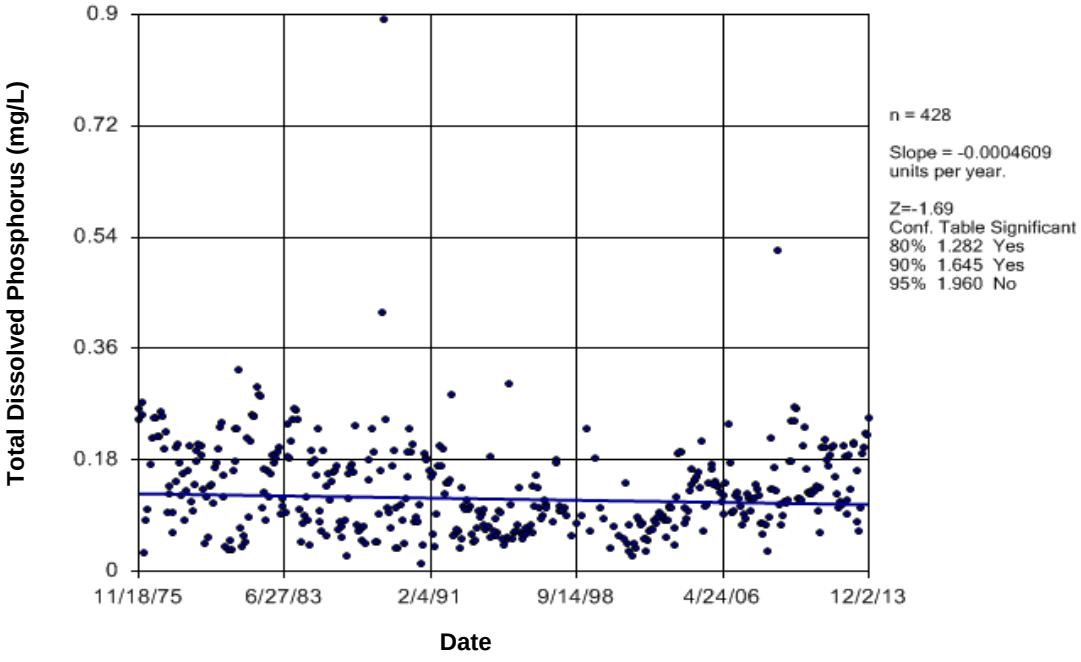


Figure B150 Qu'Appelle River: Total Dissolved Phosphorus

Time Series

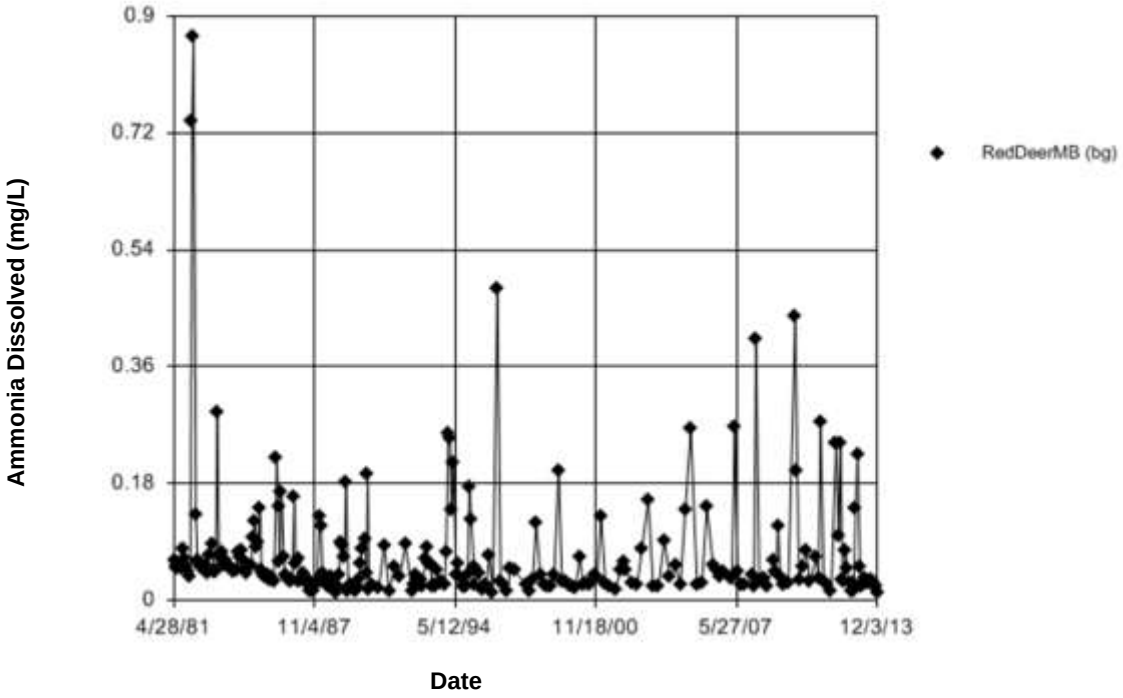


Figure B151 Red Deer River (SK-MB): Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 59.67
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 59.67
Adjusted Kruskal-Wallis statistic (H') = 59.67

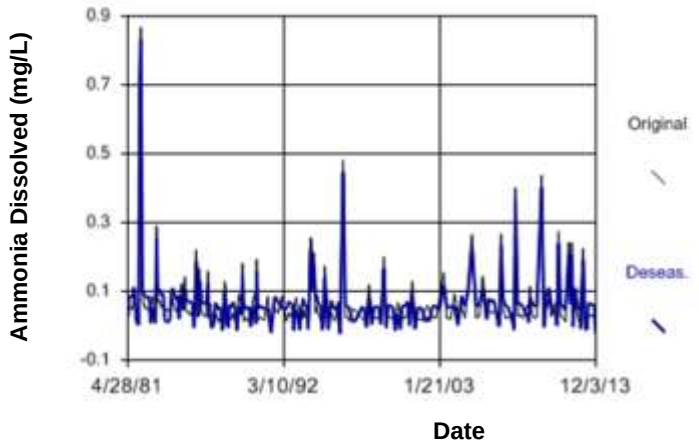


Figure B152 Red Deer River (SK-MB): Ammonia Dissolved

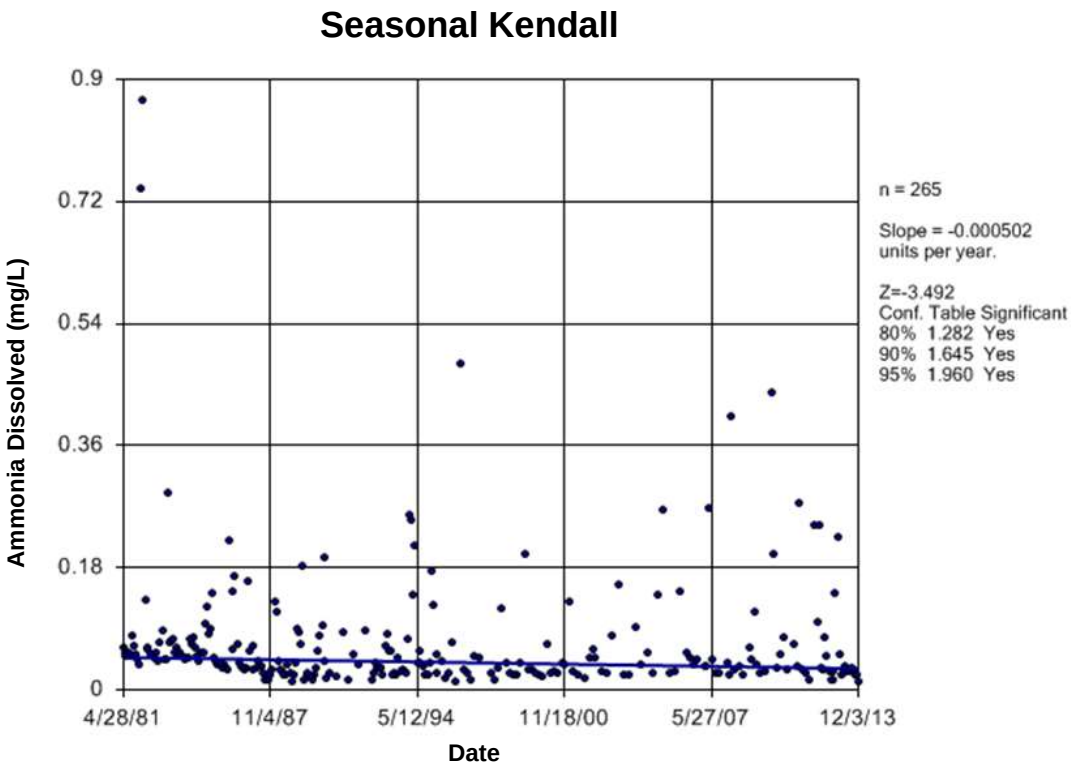


Figure B153 Red Deer River (SK-MB): Ammonia Dissolved

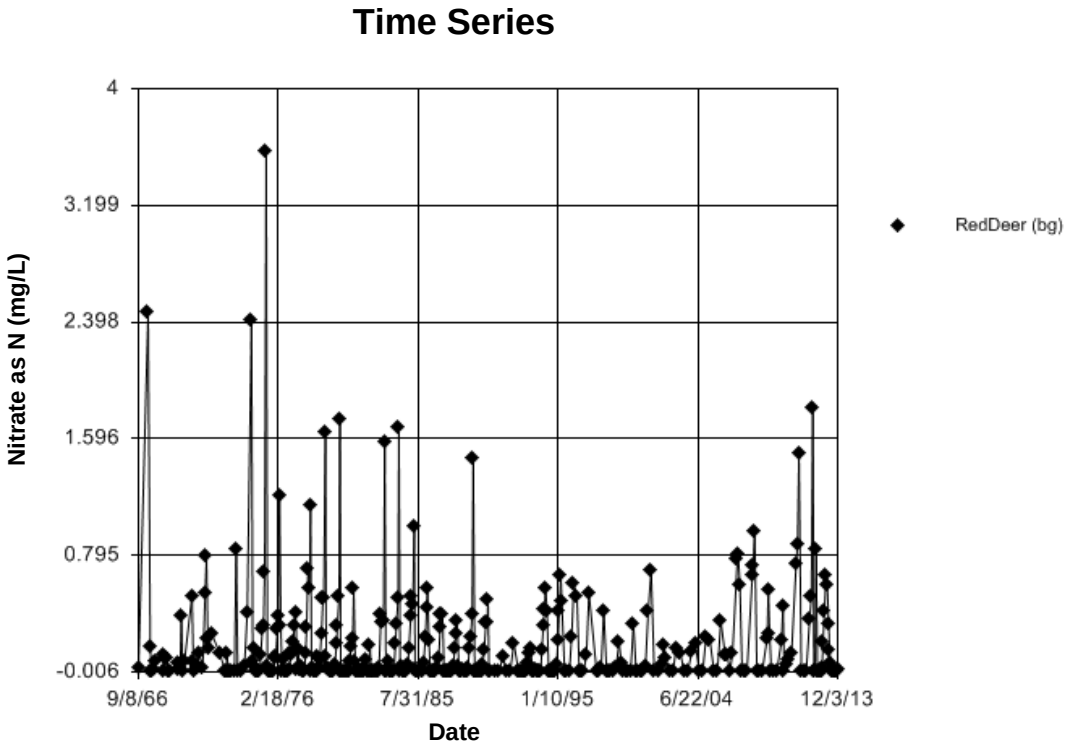


Figure B154 Red Deer River (SK-MB): Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 76.11
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 76.11
Adjusted Kruskal-Wallis statistic (H') = 76.11

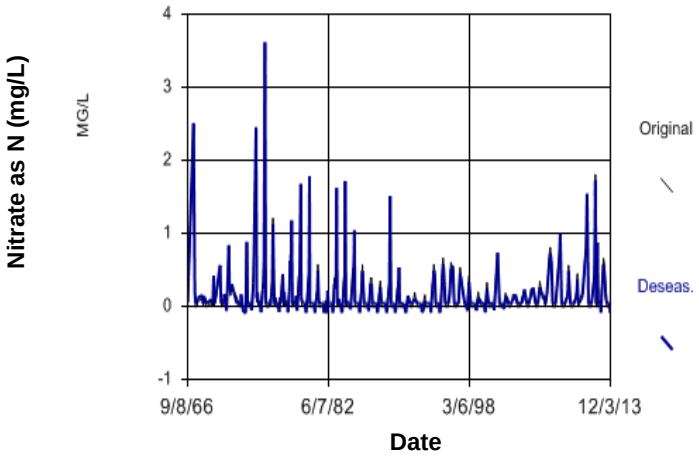


Figure B155 Red Deer River (SK-MB): Nitrate as N

Seasonal Kendall

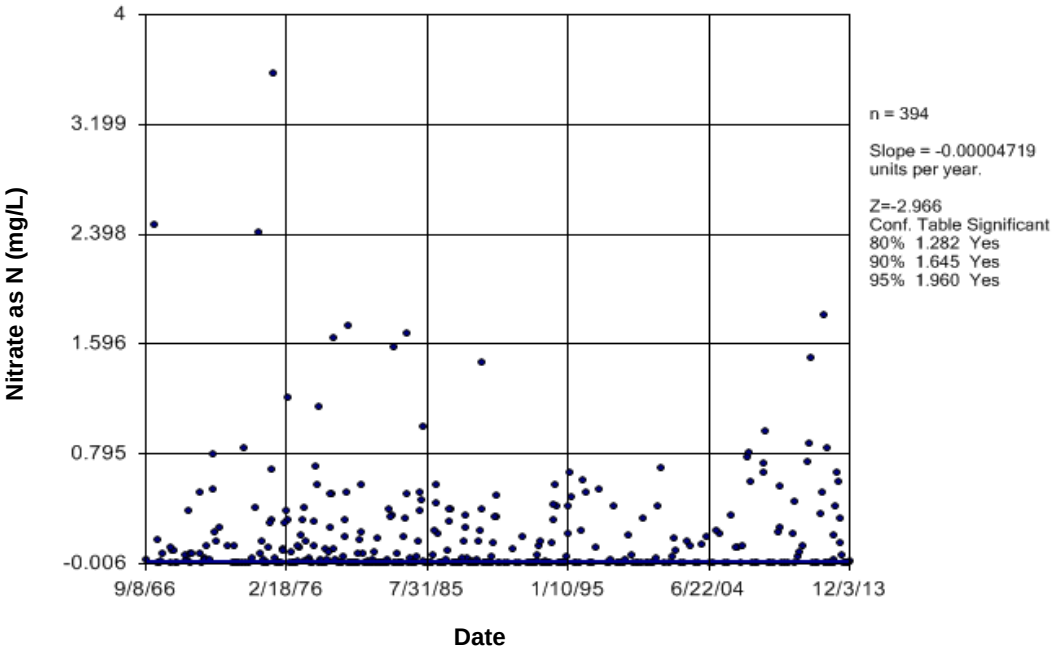


Figure B156 Red Deer River (SK-MB): Nitrate as N

Time Series

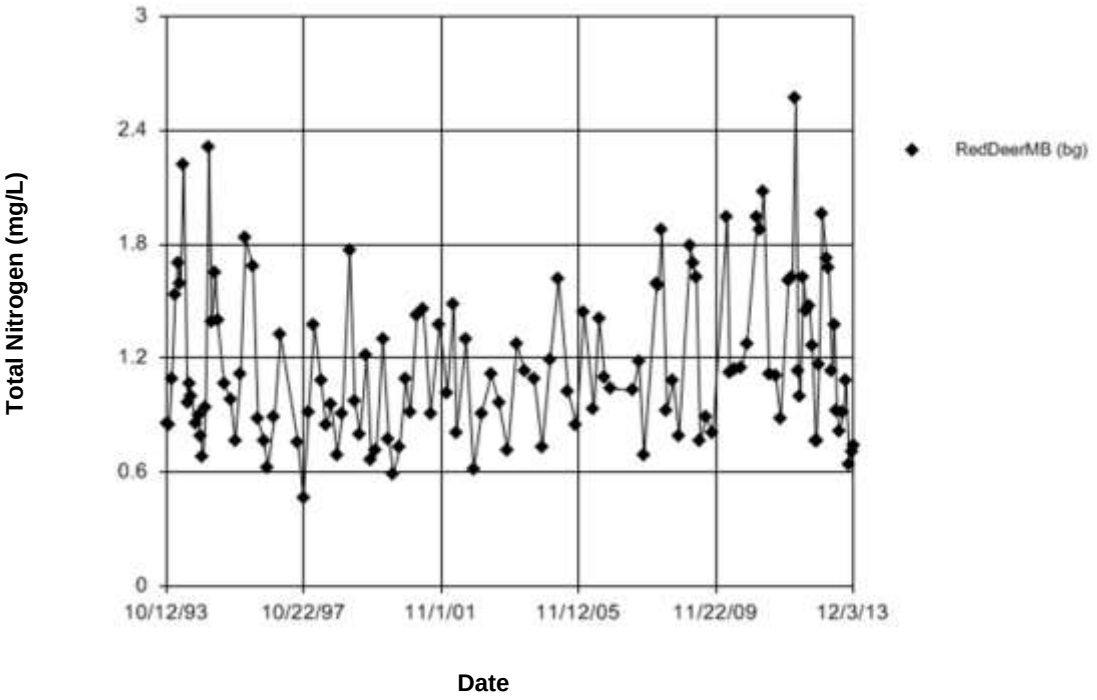


Figure B157 Red Deer River (SK-MB): Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 30.3
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 30.3
Adjusted Kruskal-Wallis statistic (H') = 30.3

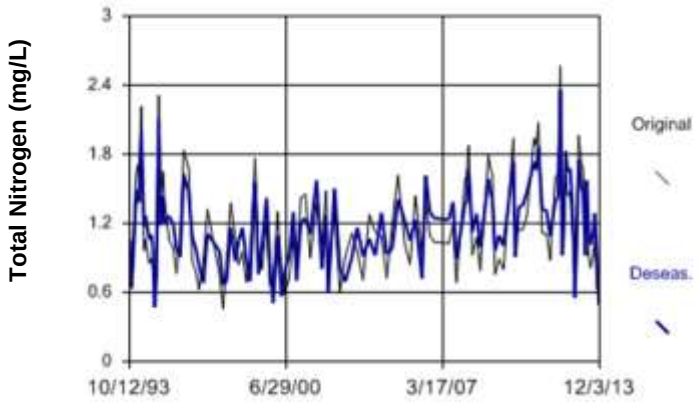


Figure B158 Red Deer River (SK-MB): Total Nitrogen

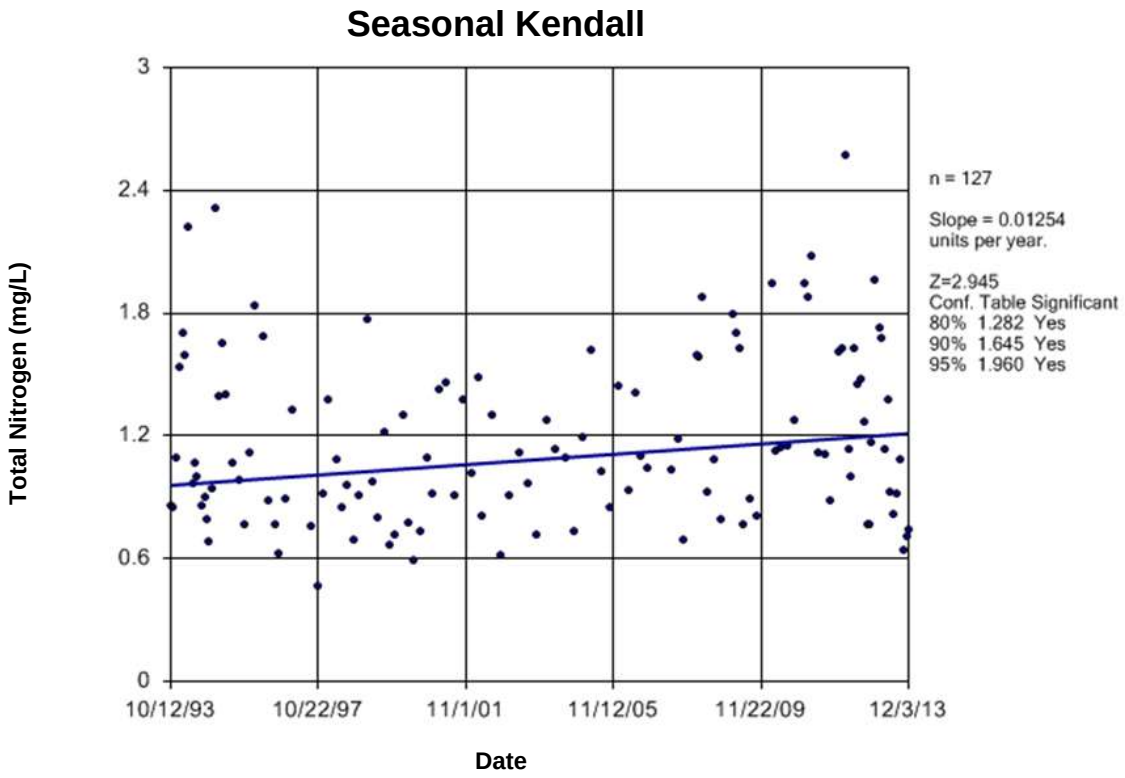


Figure B159 Red Deer River (SK-MB): Total Nitrogen

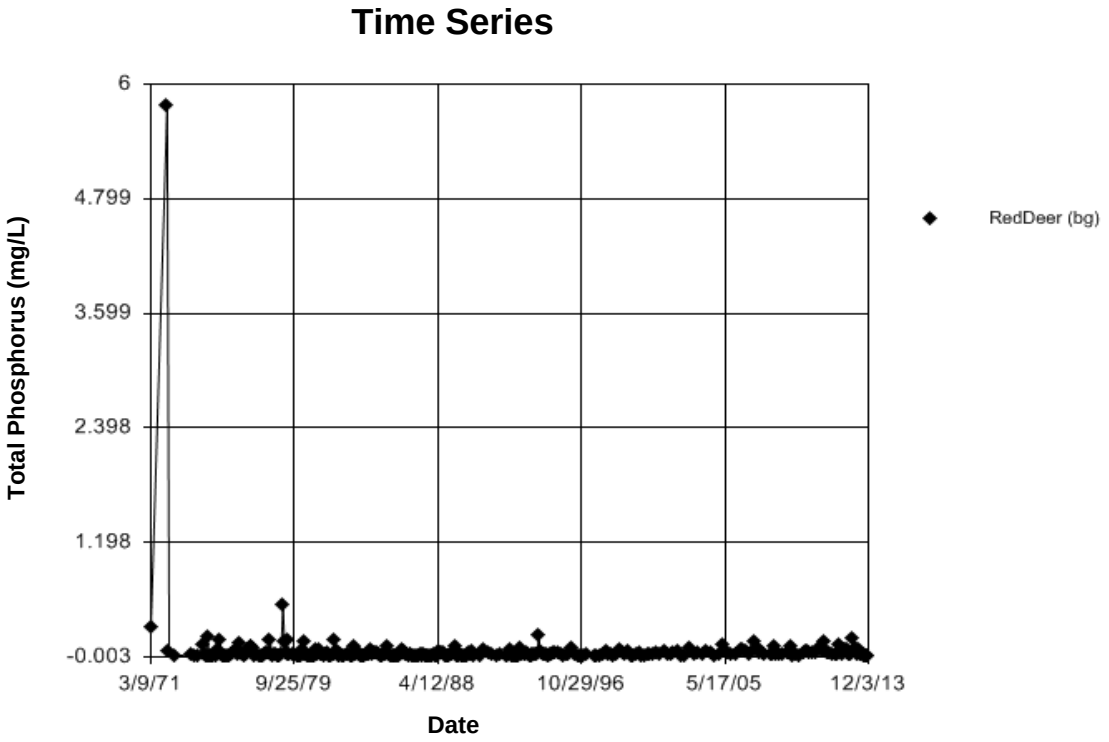


Figure B160 Red Deer River (SK-MB): Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.202
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.202
Adjusted Kruskal-Wallis statistic (H') = 1.202

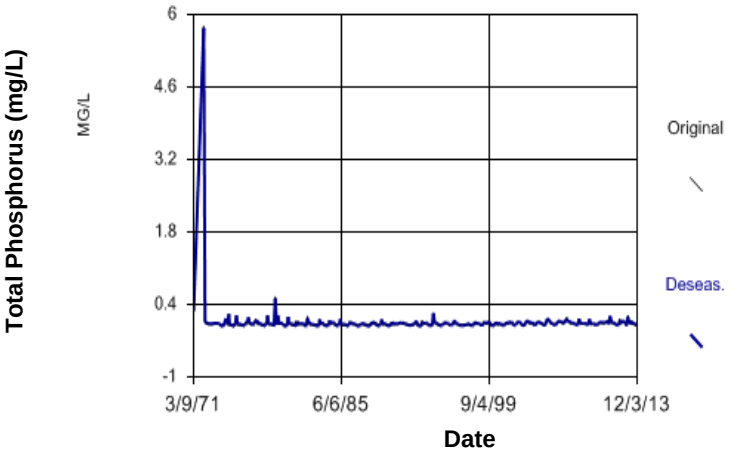


Figure B161 Red Deer River (SK-MB): Total Phosphorus

Sen's Slope Estimator

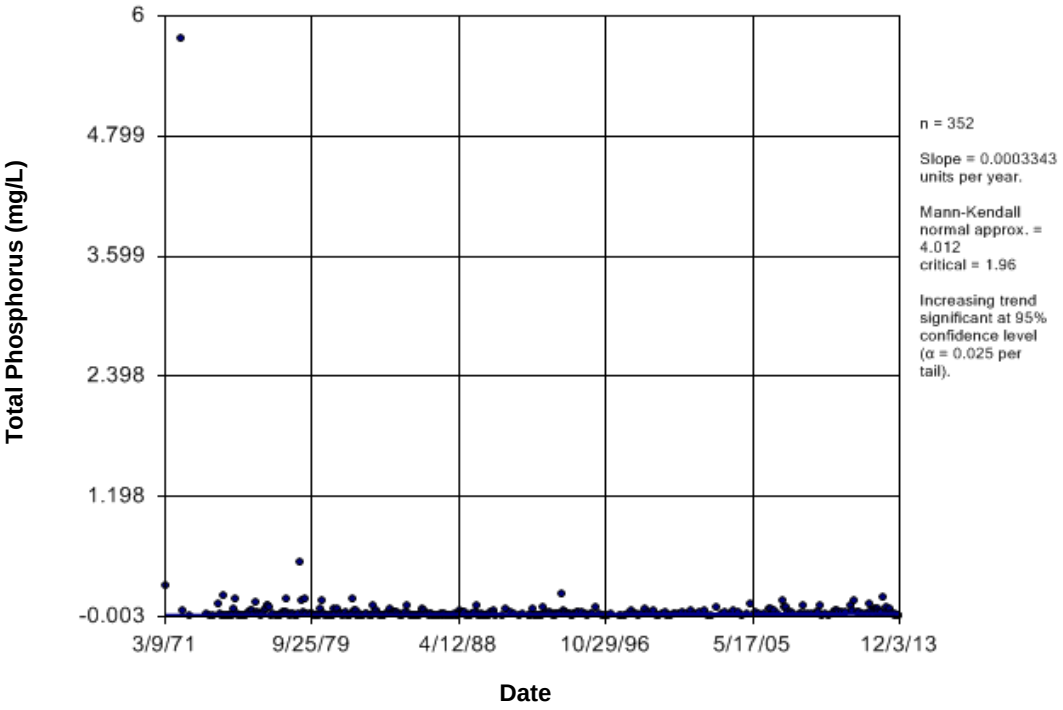


Figure B162 Red Deer River (SK-MB): Total Phosphorus

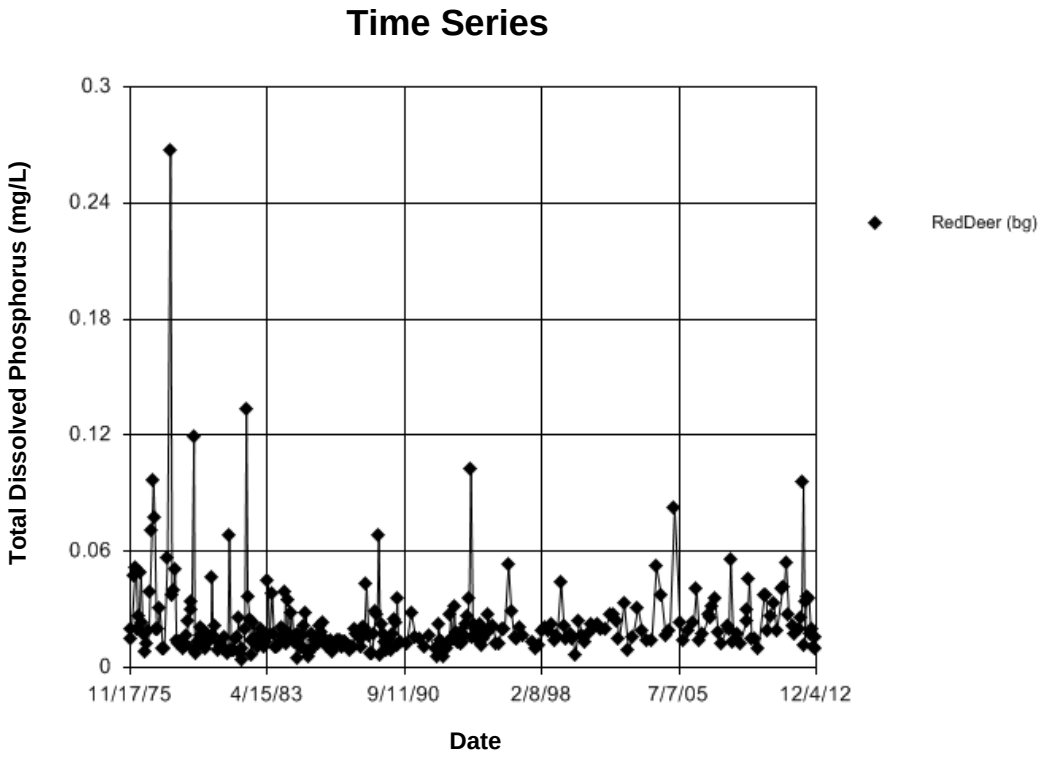


Figure B163 Red Deer River (SK-MB): Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 3.223
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 14 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 3.223
Adjusted Kruskal-Wallis statistic (H') = 3.223

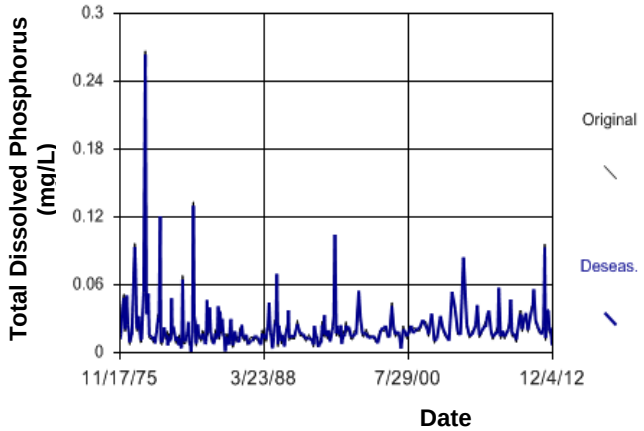


Figure B164 Red Deer River (SK-MB): Total Dissolved Phosphorus

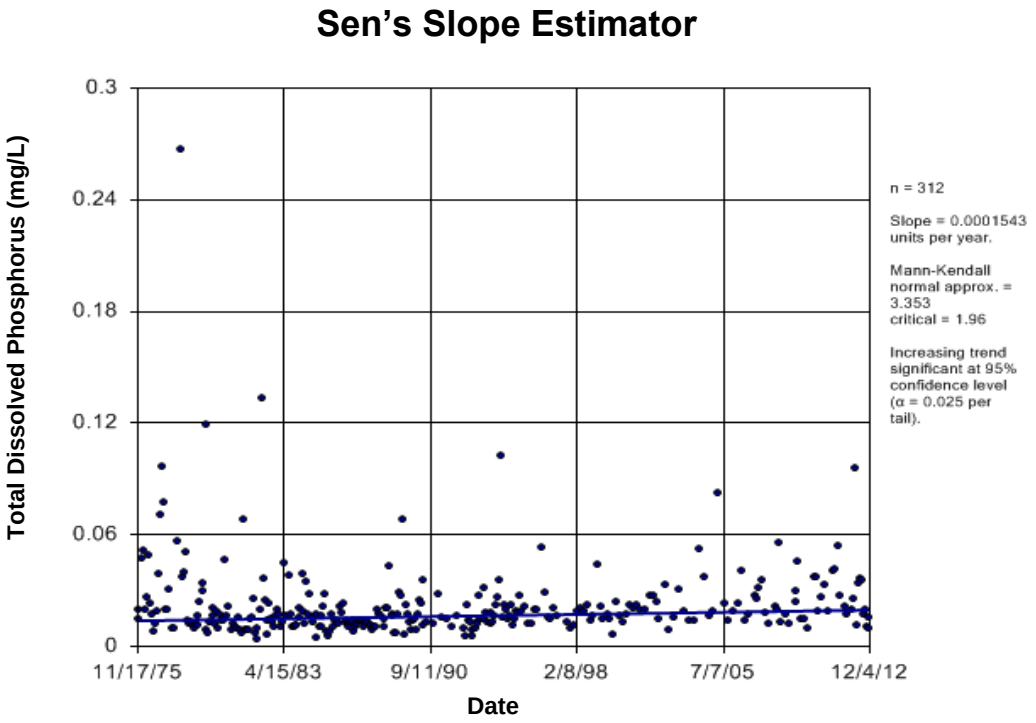


Figure B165 Red Deer River (SK-MB): Total Dissolved Phosphorus

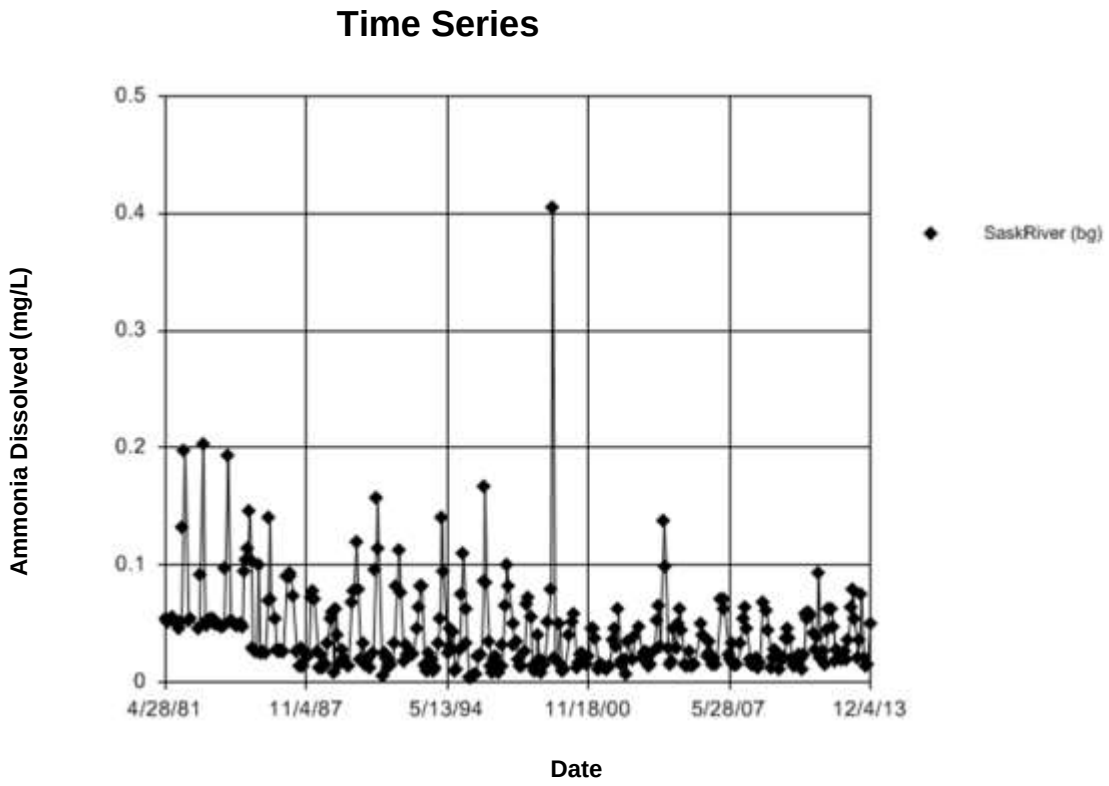


Figure B166 Saskatchewan River: Ammonia Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 125.5
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 125.5
Adjusted Kruskal-Wallis statistic (H') = 125.5

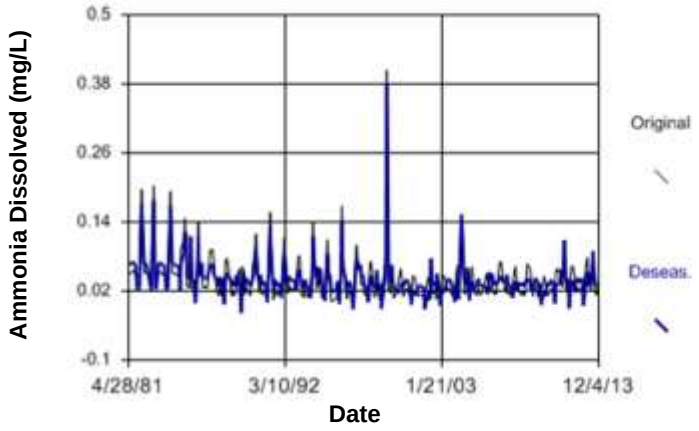


Figure B167 Saskatchewan River: Ammonia Dissolved

Seasonal Kendall

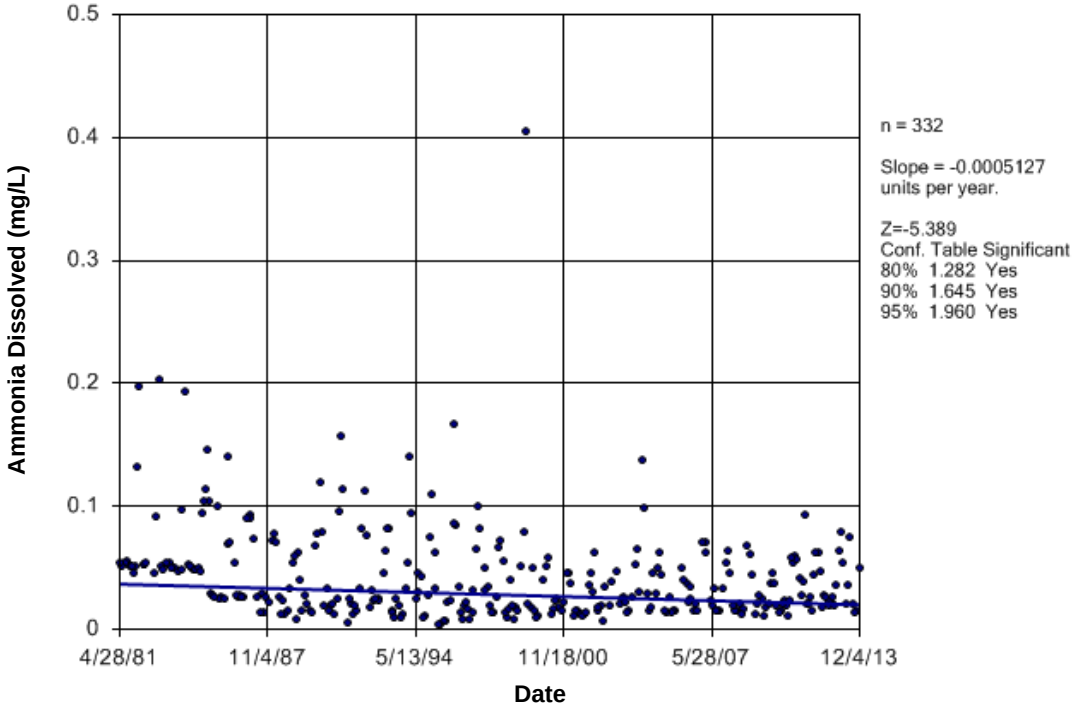


Figure B168 Saskatchewan River: Ammonia Dissolved

Time Series

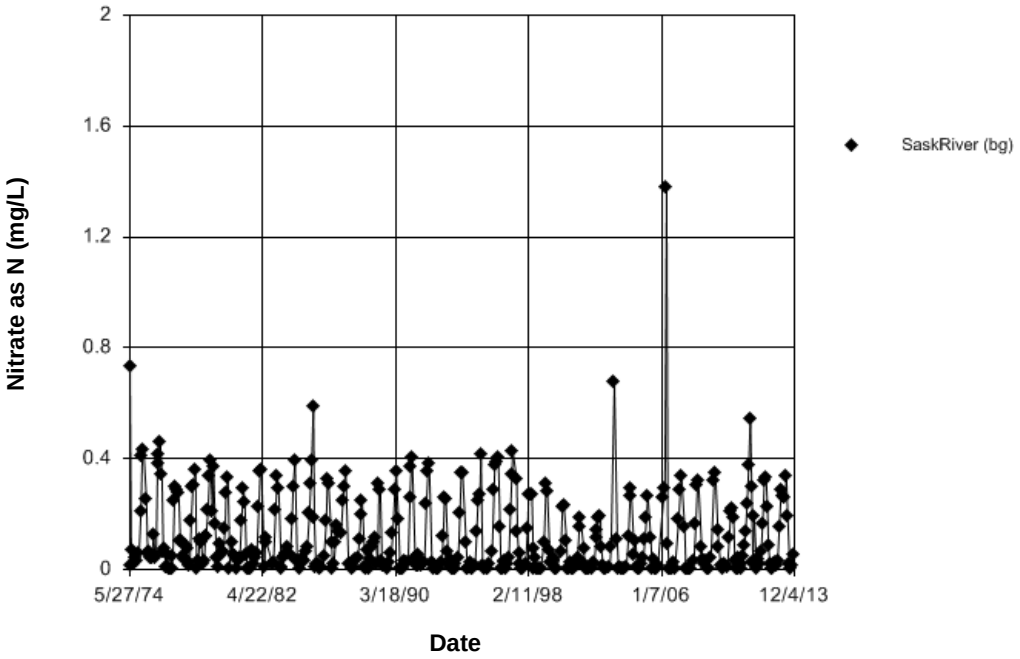


Figure B169 Saskatchewan River: Nitrate as N

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 110.2
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 110.2
Adjusted Kruskal-Wallis statistic (H') = 110.2

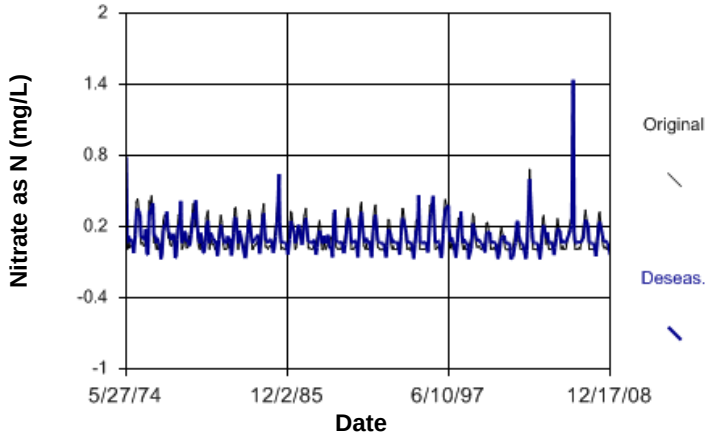


Figure B170 Saskatchewan River: Nitrate as N

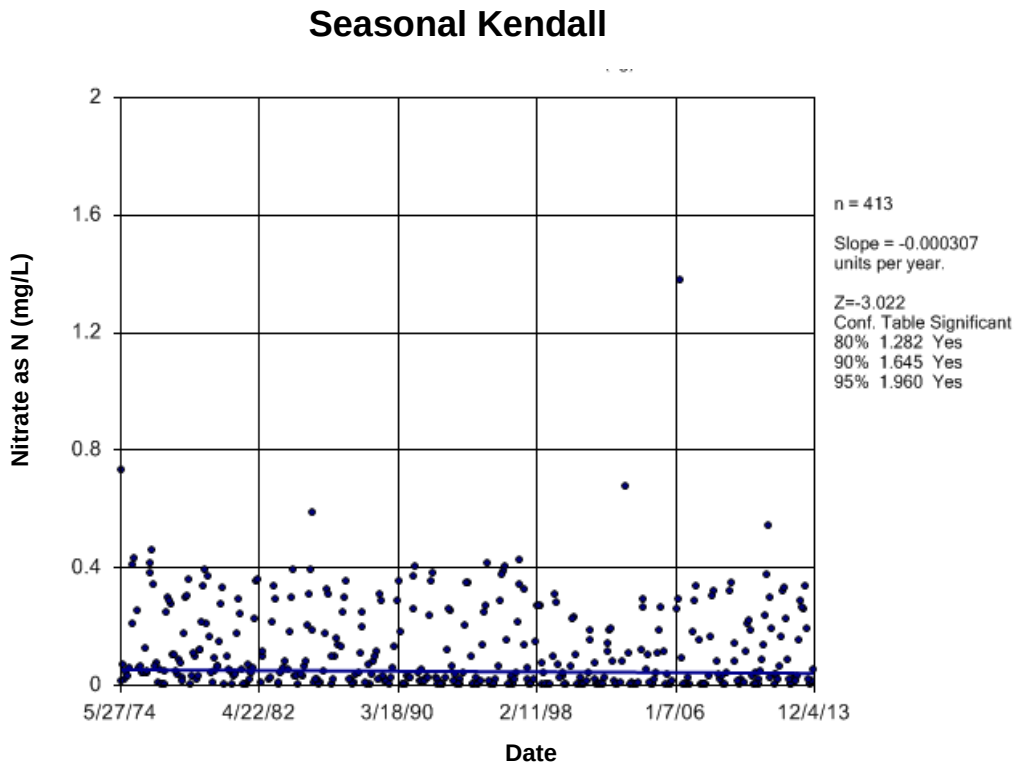


Figure B171 Saskatchewan River: Nitrate as N

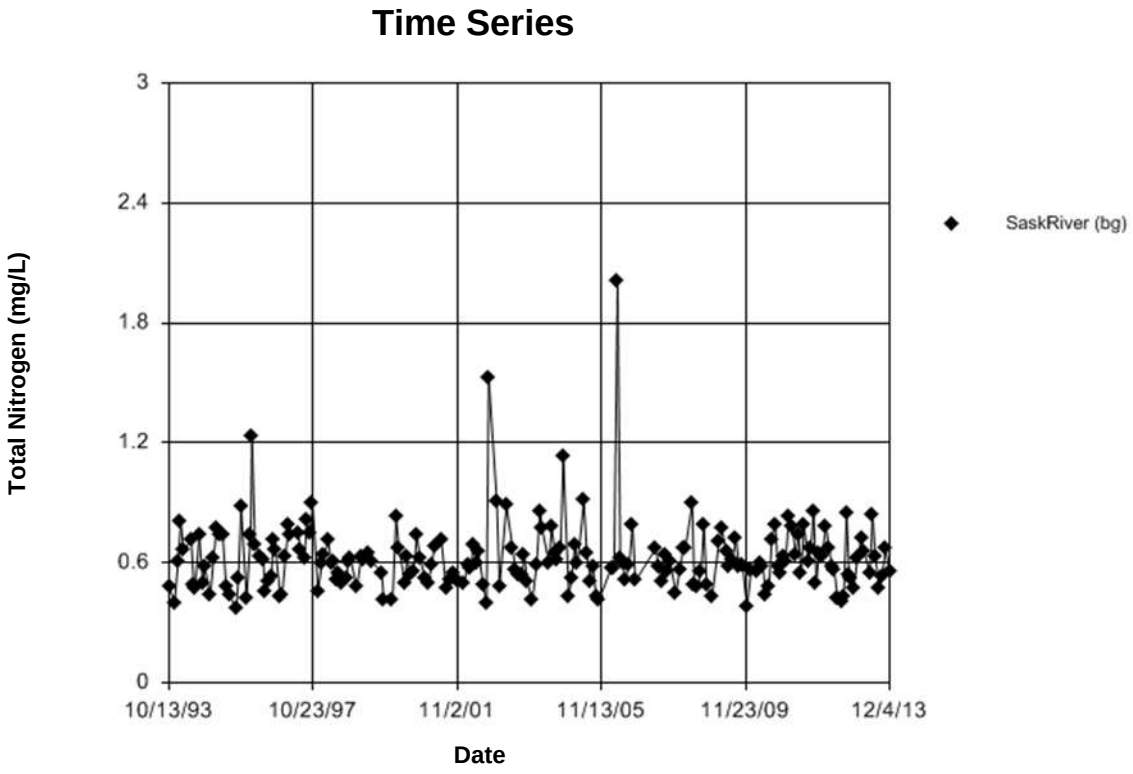


Figure B172 Saskatchewan River: Total Nitrogen

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.3563
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.3563
Adjusted Kruskal-Wallis statistic (H') = 0.3563

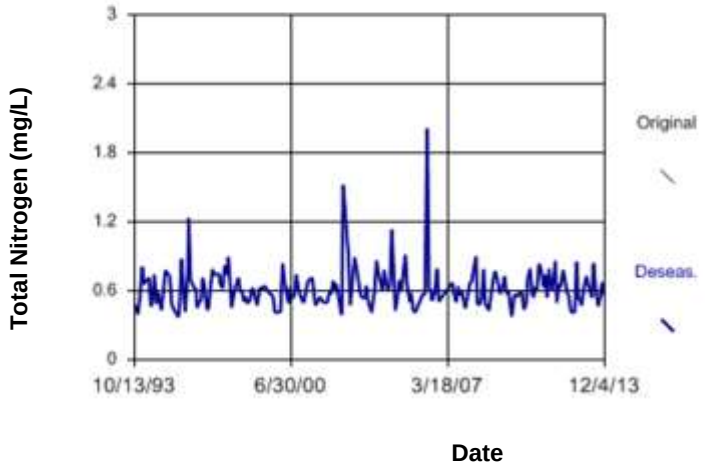


Figure B173 Saskatchewan River: Total Nitrogen

Sen's Slope Estimator

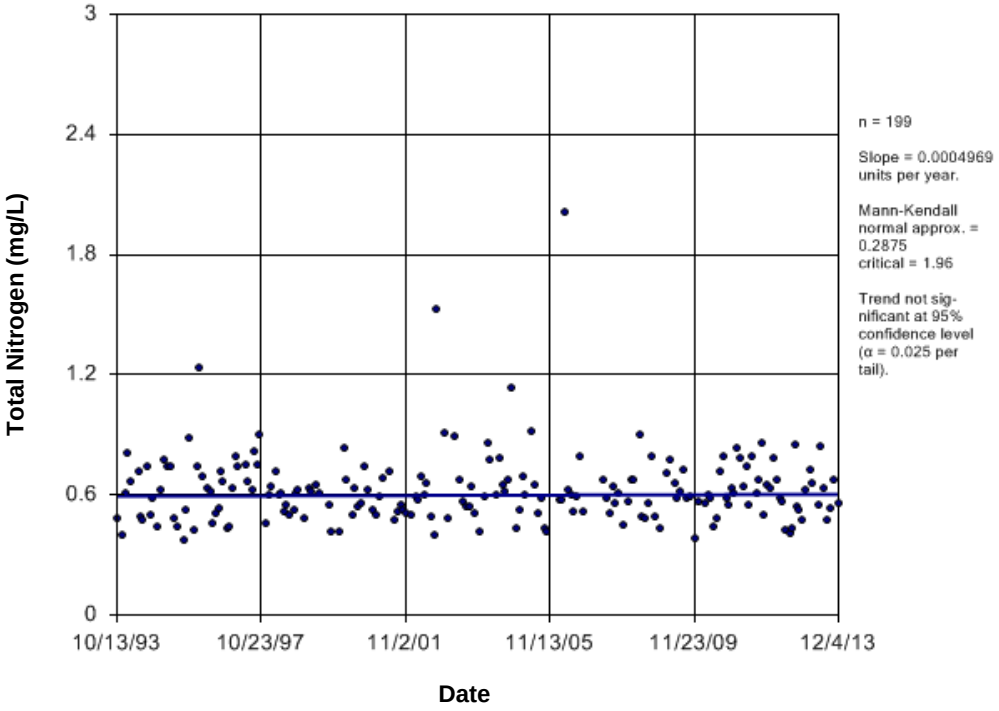


Figure B174 Saskatchewan River: Total Nitrogen

Time Series

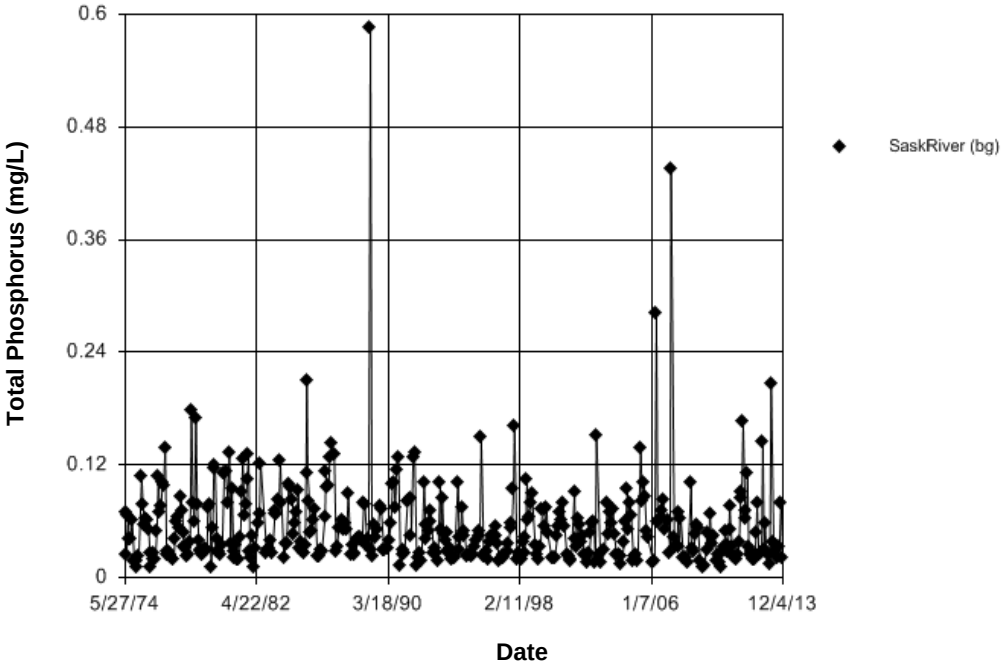


Figure B175 Saskatchewan River: Total Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 201.6
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 201.6
Adjusted Kruskal-Wallis statistic (H') = 201.6

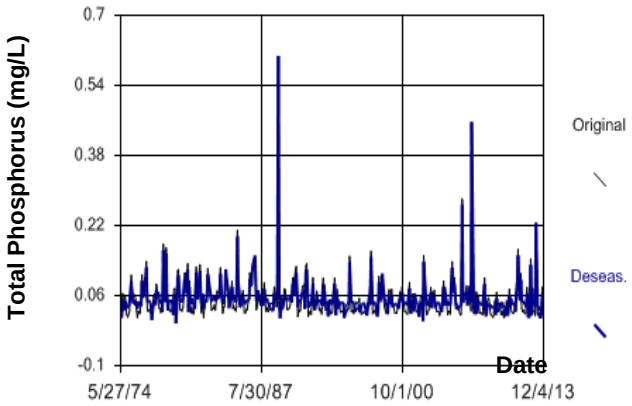


Figure B176 Saskatchewan River: Total Phosphorus

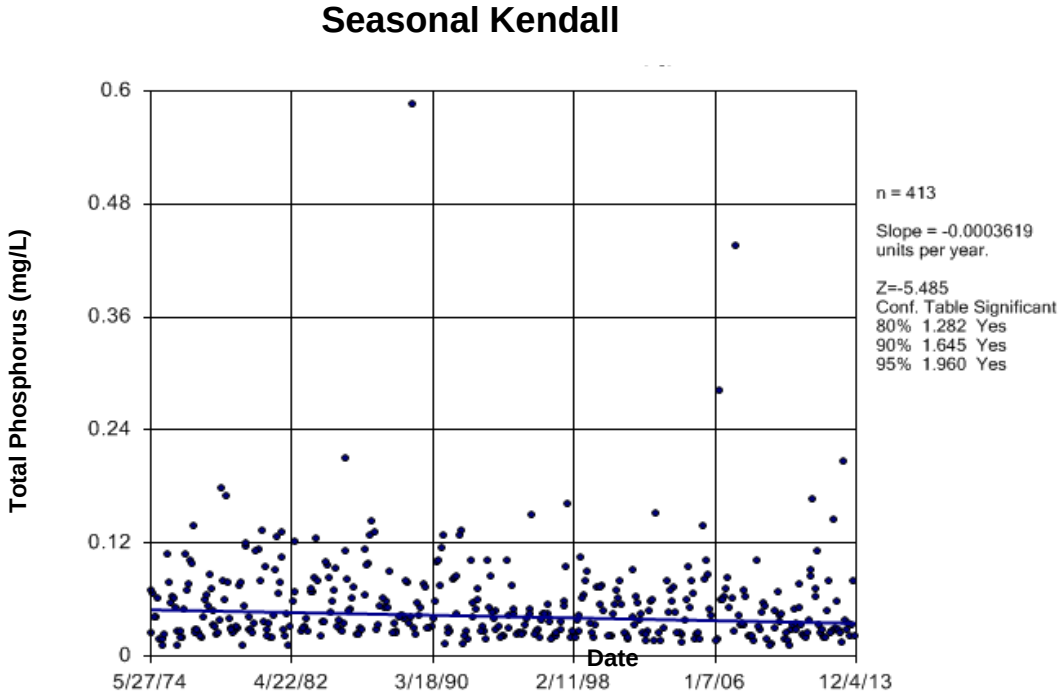


Figure B177 Saskatchewan River: Total Phosphorus

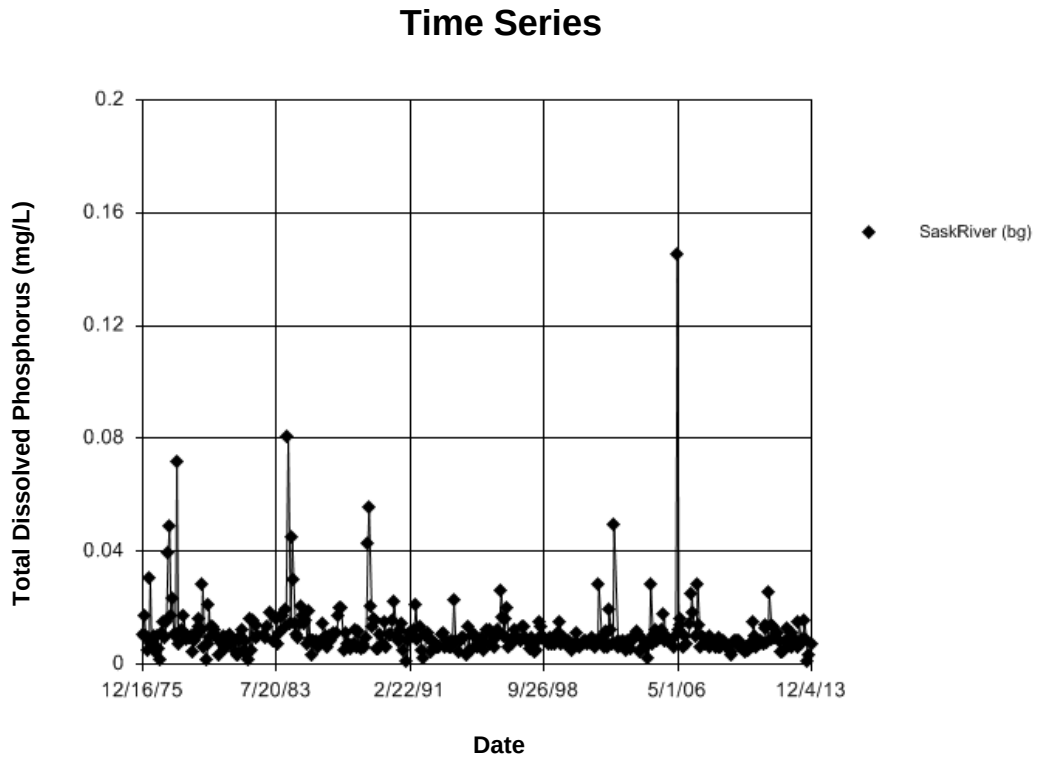


Figure B178 Saskatchewan River: Total Dissolved Phosphorus

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 3.534
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 31 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 3.534
Adjusted Kruskal-Wallis statistic (H') = 3.534

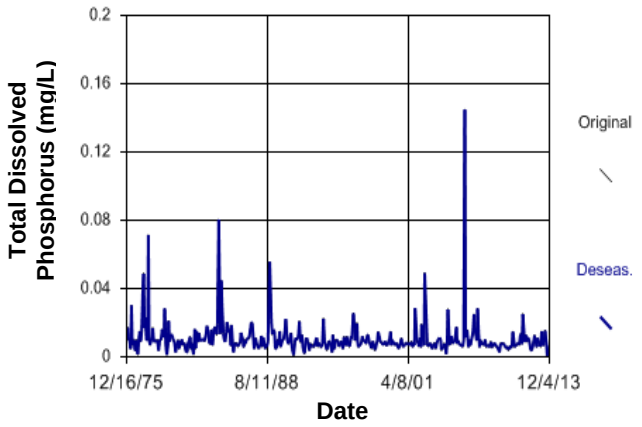


Figure B179 Saskatchewan River: Total Dissolved Phosphorus

Sen's Slope Estimator

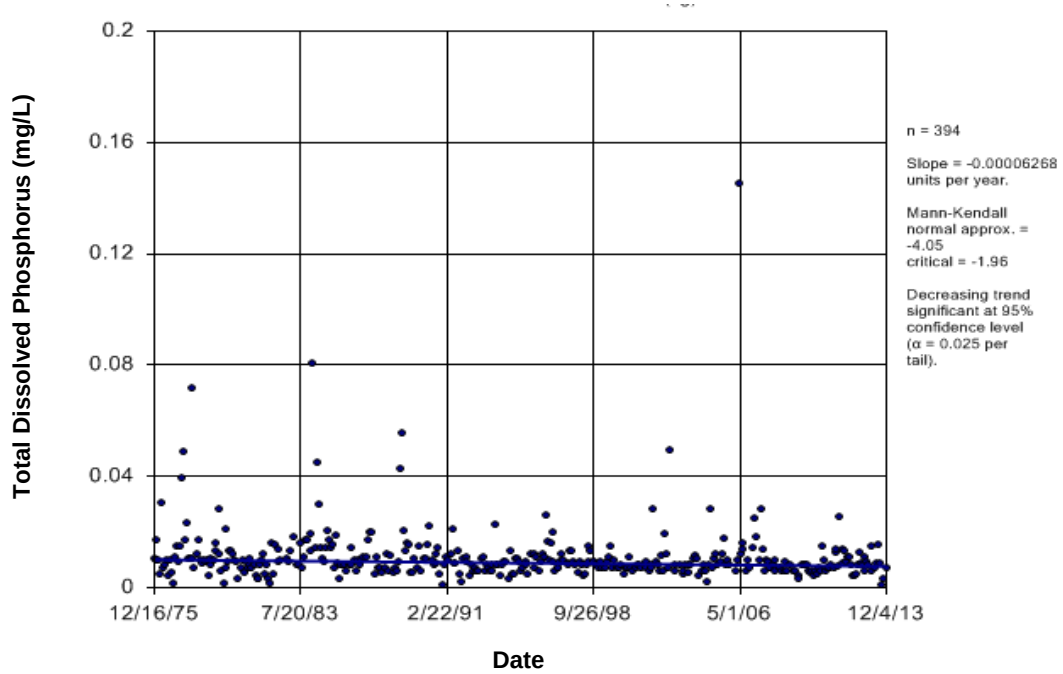


Figure B180 Saskatchewan River: Total Dissolved Phosphorus

Appendix C: Major Ions Trending Graphs

Time Series

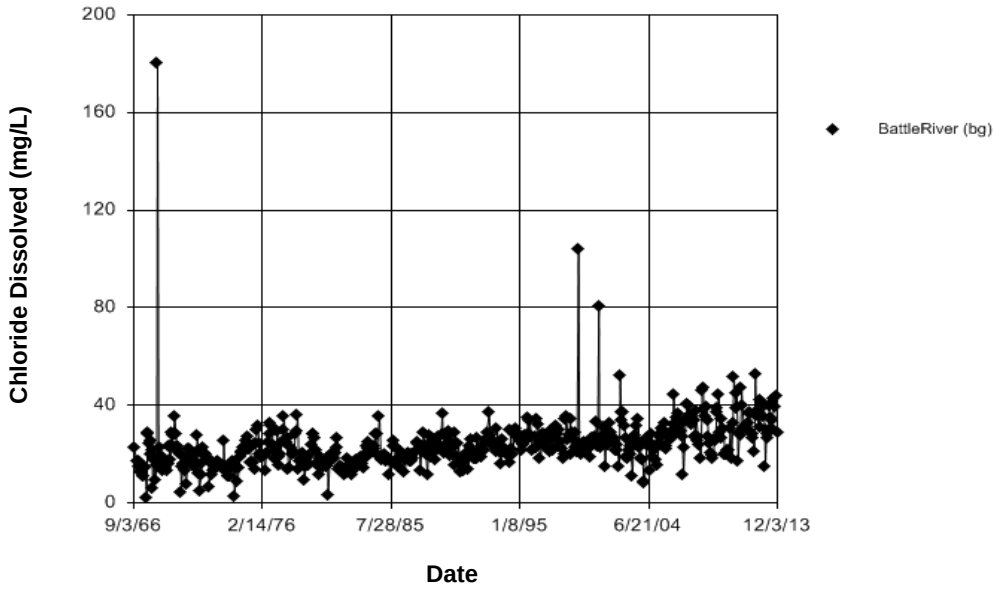


Figure C1 Battle River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 16.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 56 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 16.7
Adjusted Kruskal-Wallis statistic (H') = 16.7

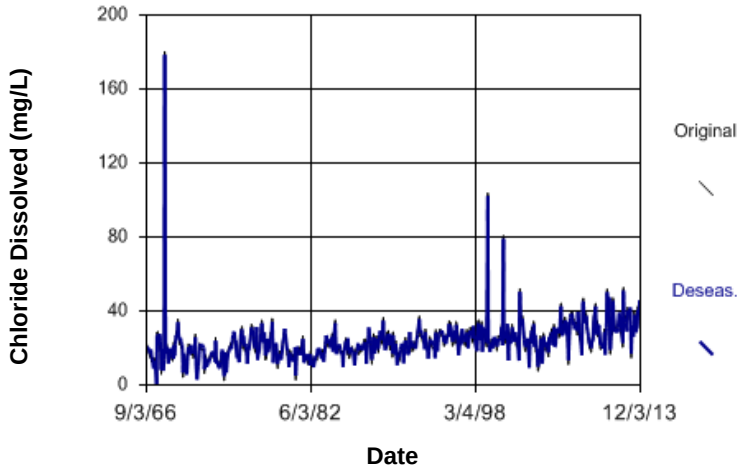


Figure C2 Battle River: Chloride Dissolved

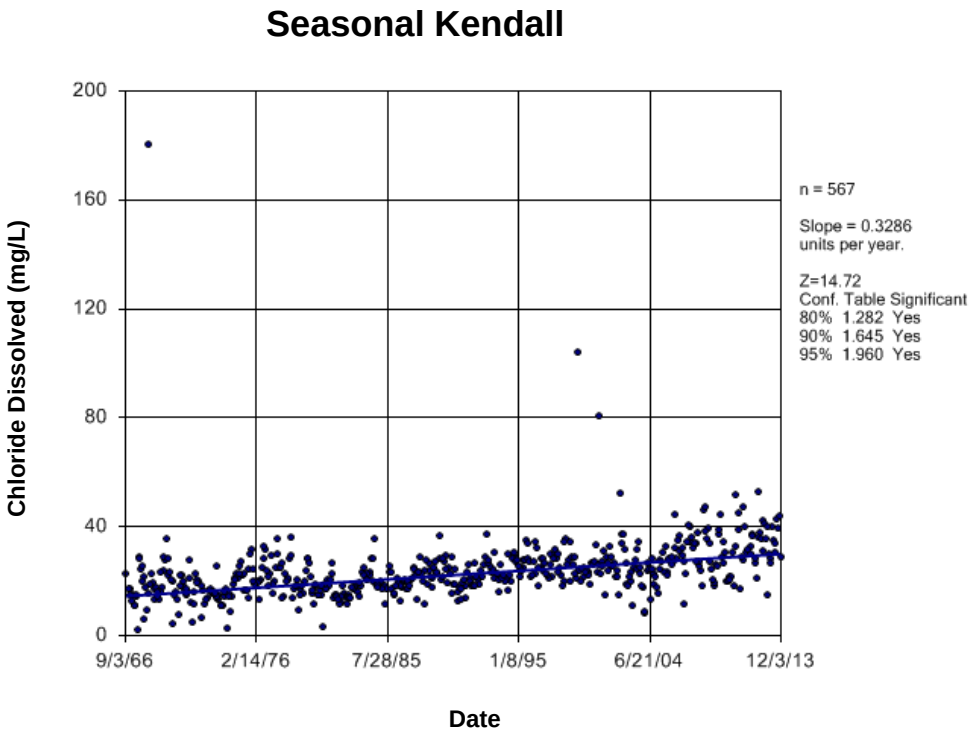


Figure C3 Battle River: Chloride Dissolved

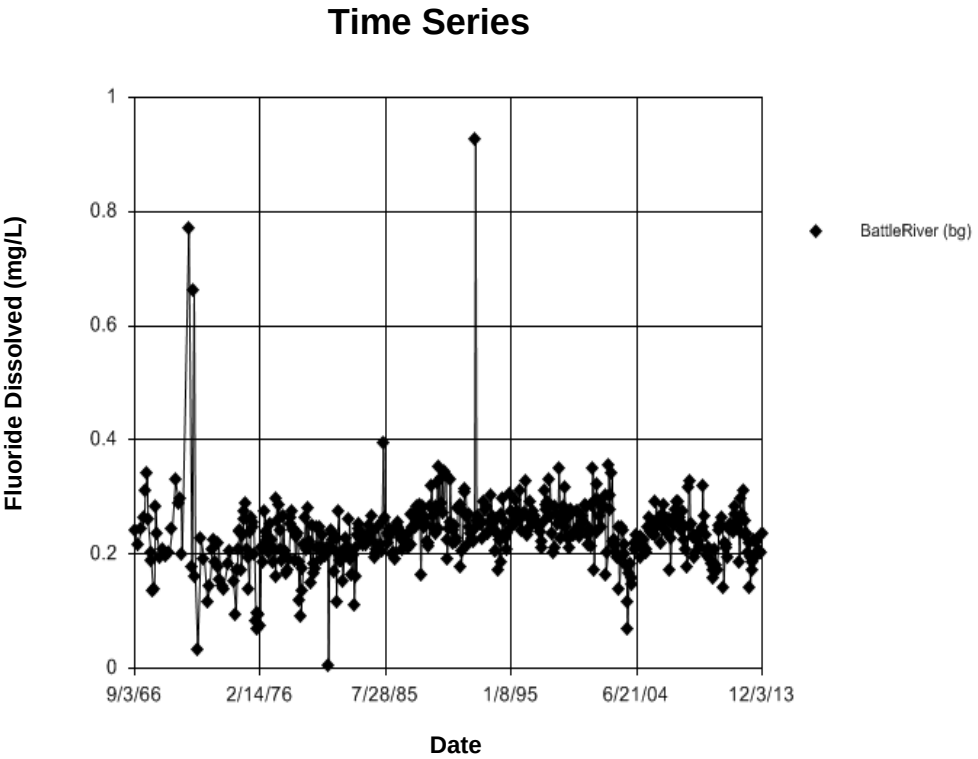


Figure C4 Battle River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 11.36
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 78 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 11.36
Adjusted Kruskal-Wallis statistic (H') = 11.36

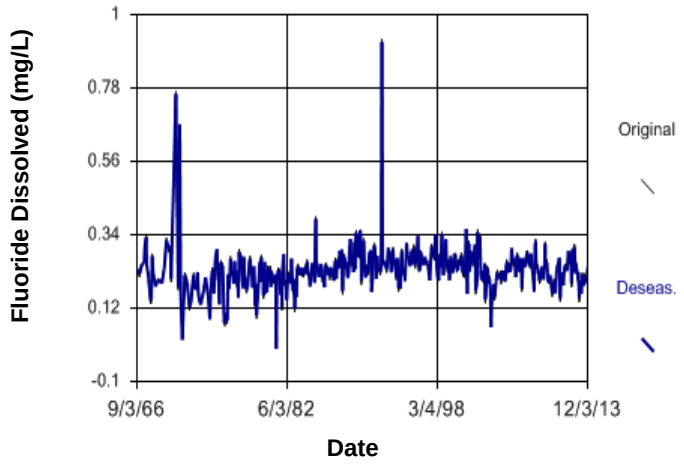


Figure C5 Battle River: Fluoride Dissolved

Seasonal Kendall

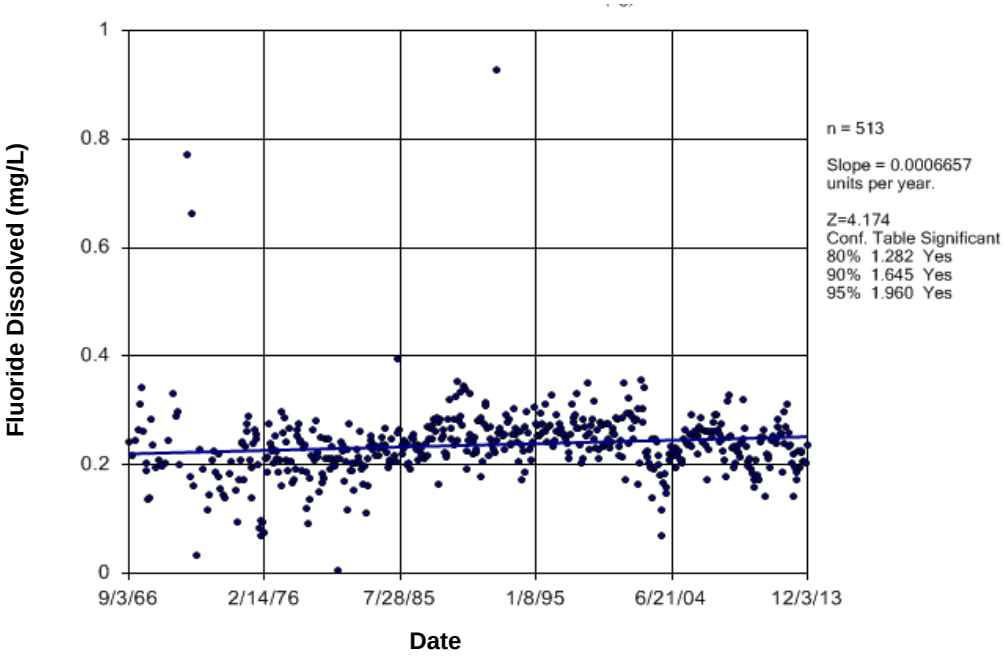


Figure C6 Battle River: Fluoride Dissolved

Time Series

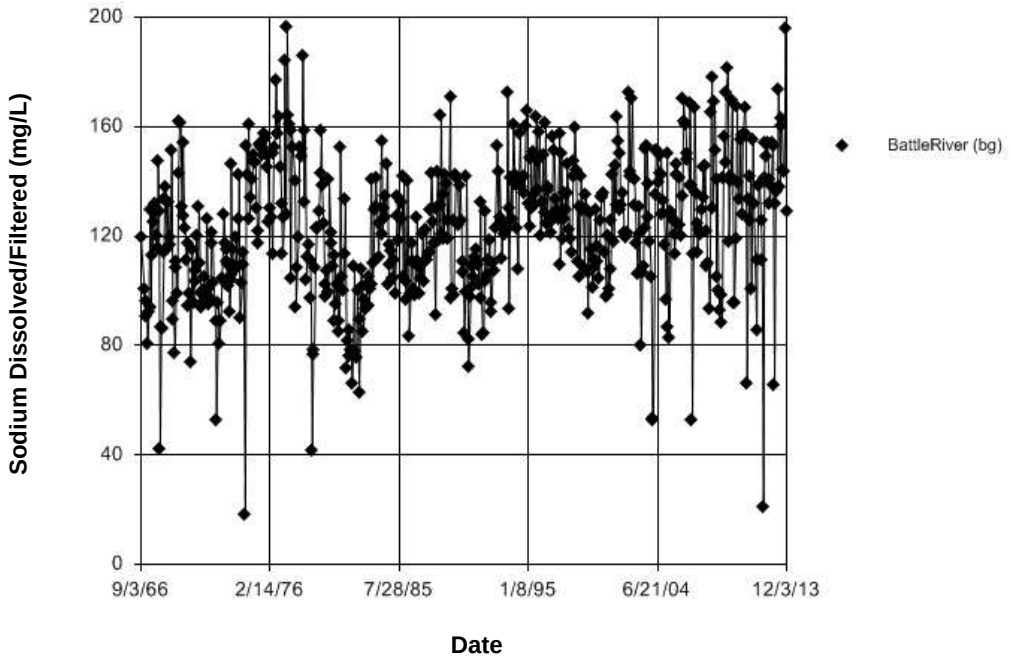


Figure C7 Battle River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 13.8
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 107 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 13.8
Adjusted Kruskal-Wallis statistic (H') = 13.8

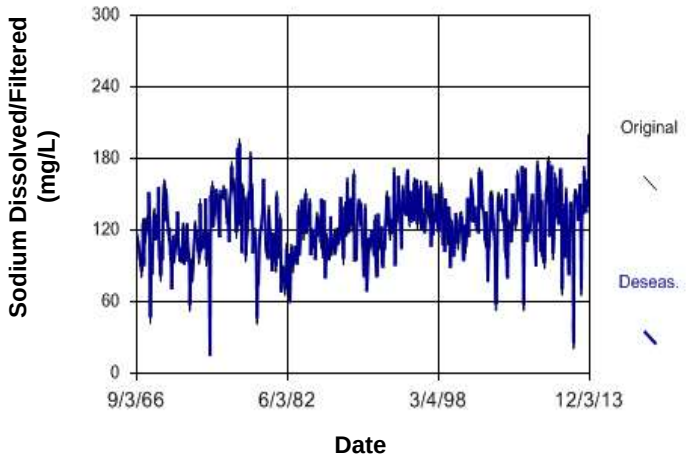


Figure C8 Battle River: Sodium Dissolved/Filtered

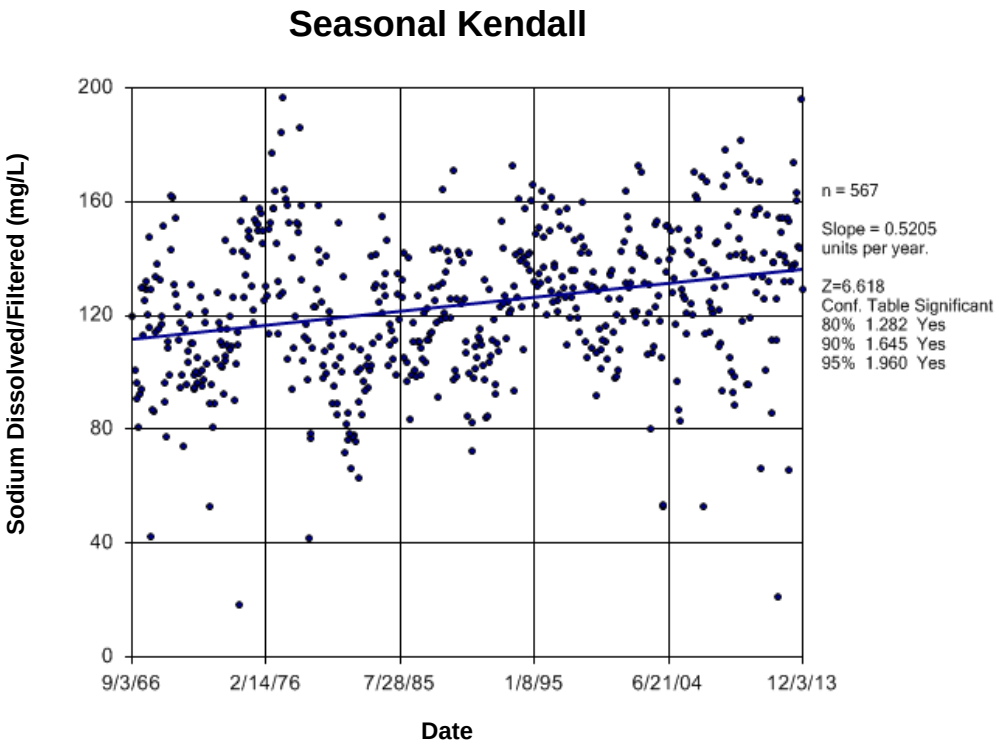


Figure C9 Battle River: Sodium Dissolved/Filtered

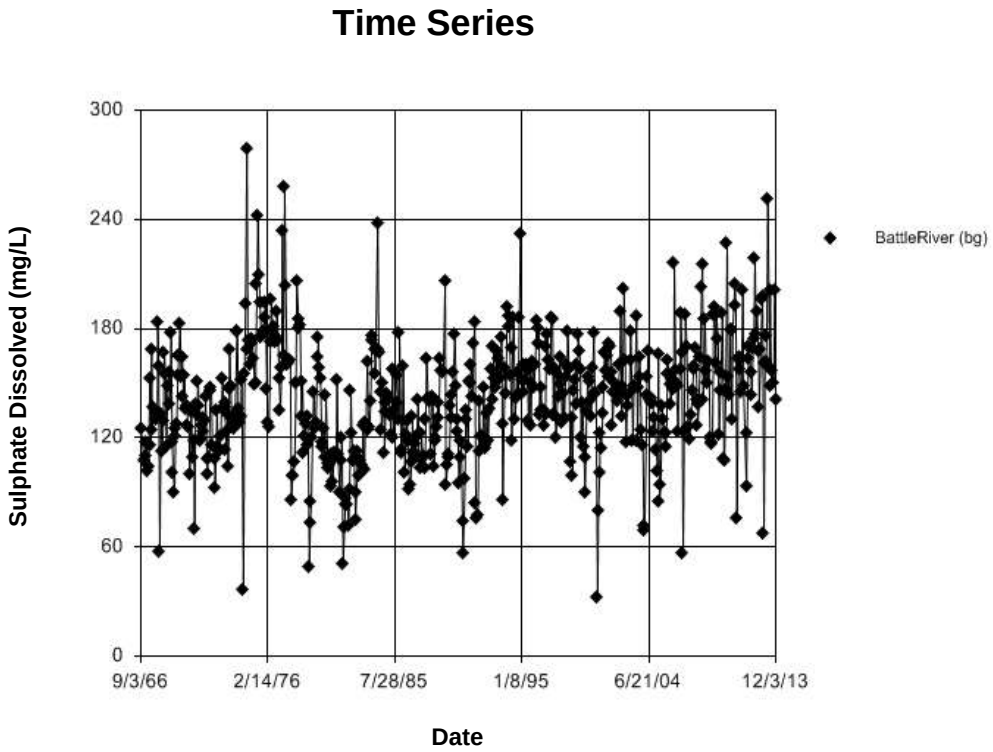


Figure C10 Battle River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.05724
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 93 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.05724
Adjusted Kruskal-Wallis statistic (H') = 0.05724

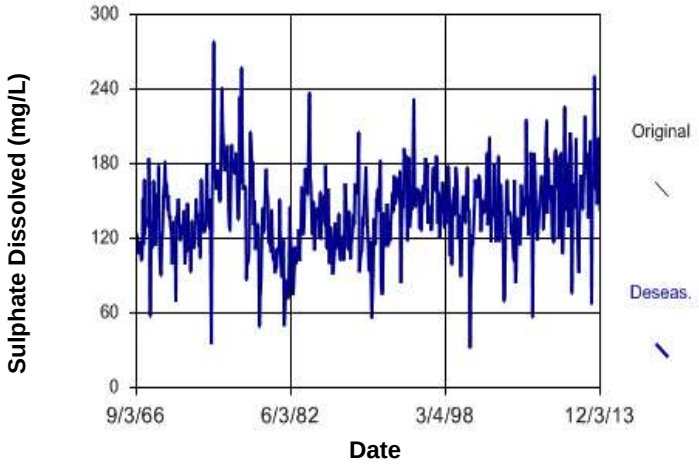


Figure C11 Battle River: Sulphate Dissolved

Sen's Slope Estimator

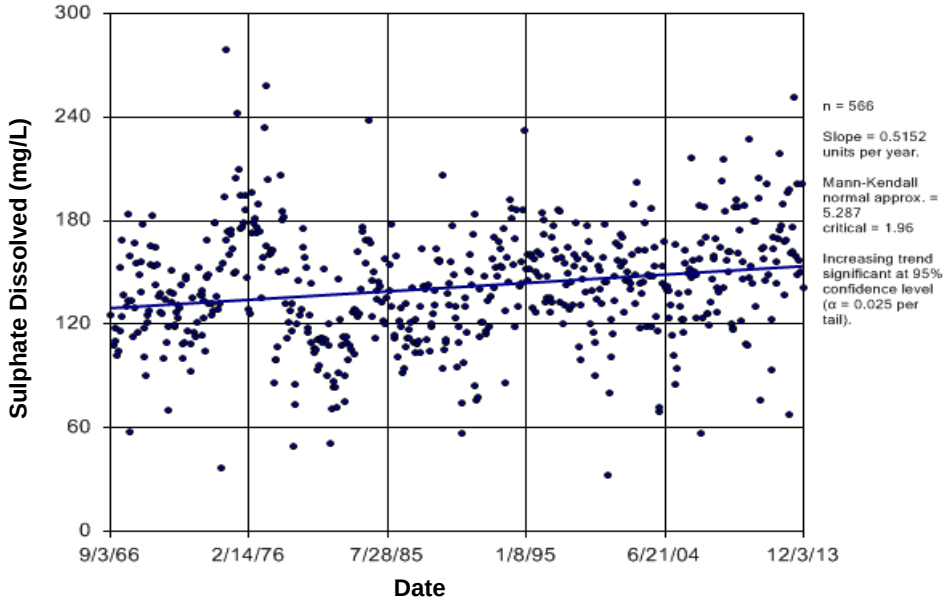


Figure C12 Battle River: Sulphate Dissolved

Time Series

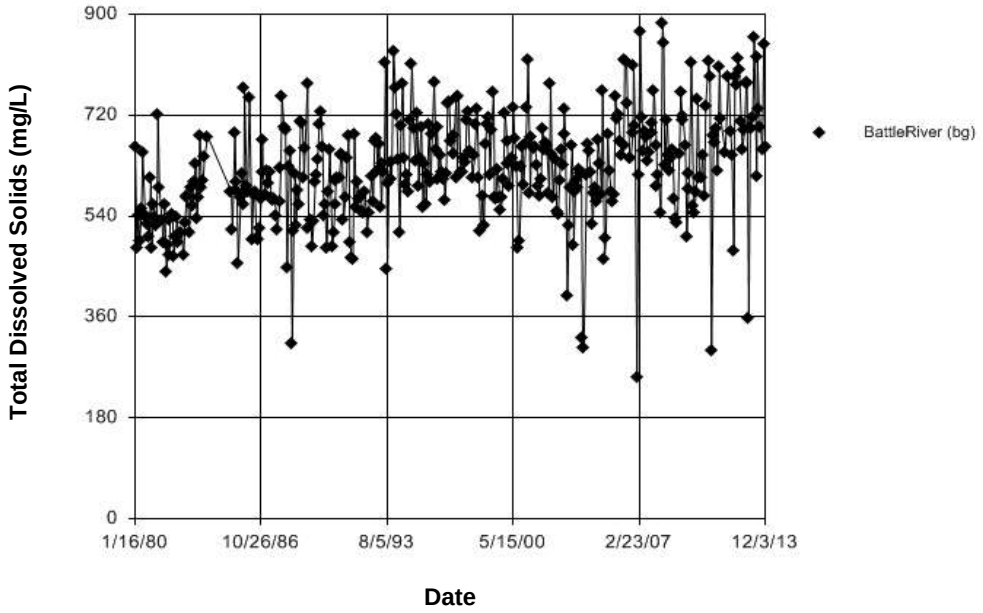


Figure C13 Battle River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 15.14
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 19 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 15.14
Adjusted Kruskal-Wallis statistic (H') = 15.14

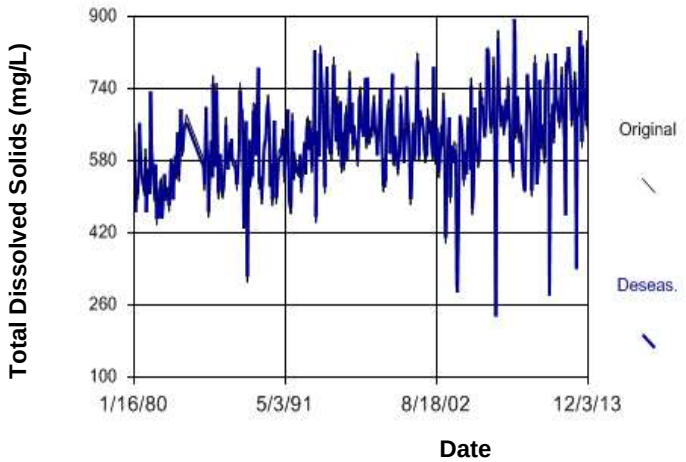


Figure C14 Battle River: Total Dissolved Solids

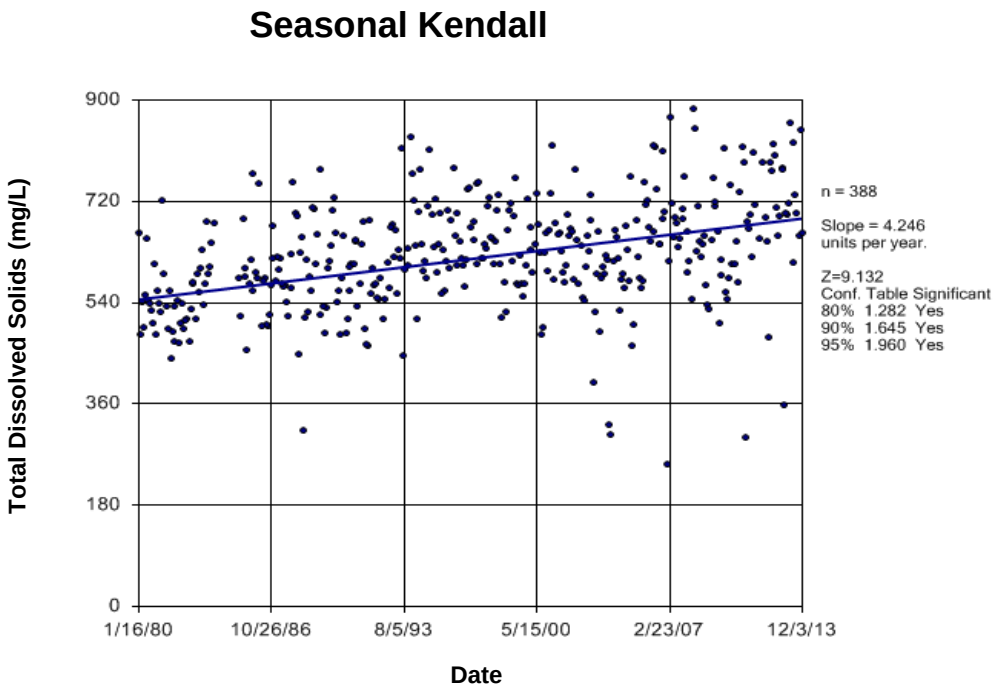


Figure C15 Battle River: Total Dissolved Solids

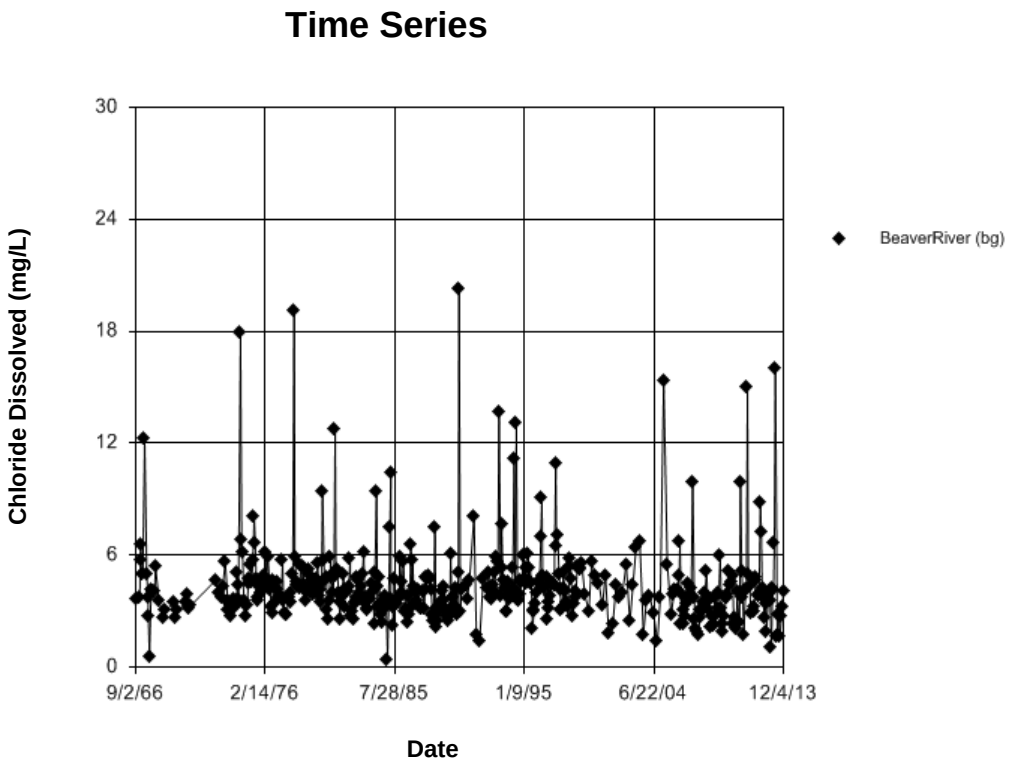


Figure C16 Beaver River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 28.03
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 28.03
Adjusted Kruskal-Wallis statistic (H') = 28.03

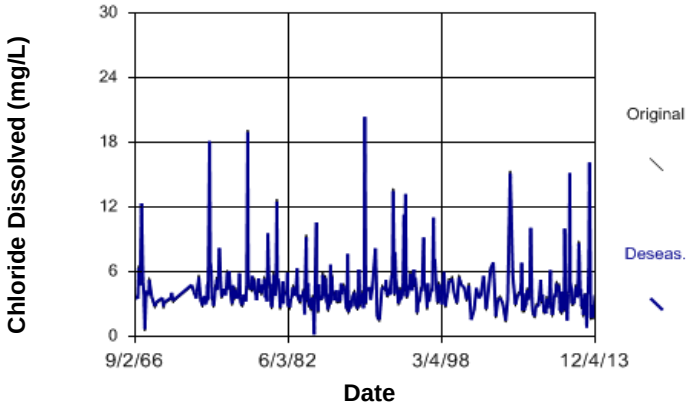


Figure C17 Beaver River: Chloride Dissolved

Seasonal Kendall

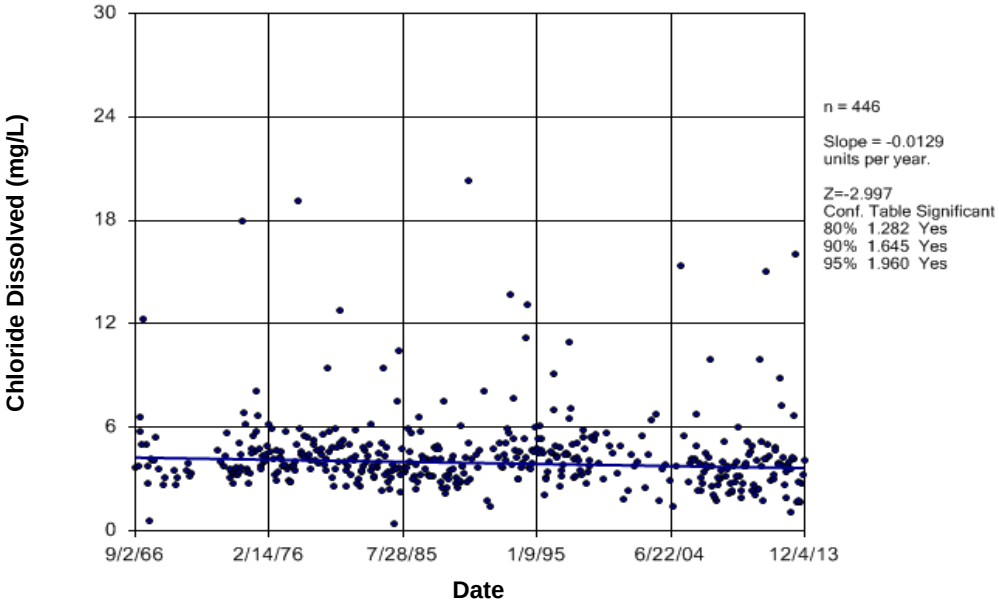


Figure C18 Beaver River: Chloride Dissolved

Time Series

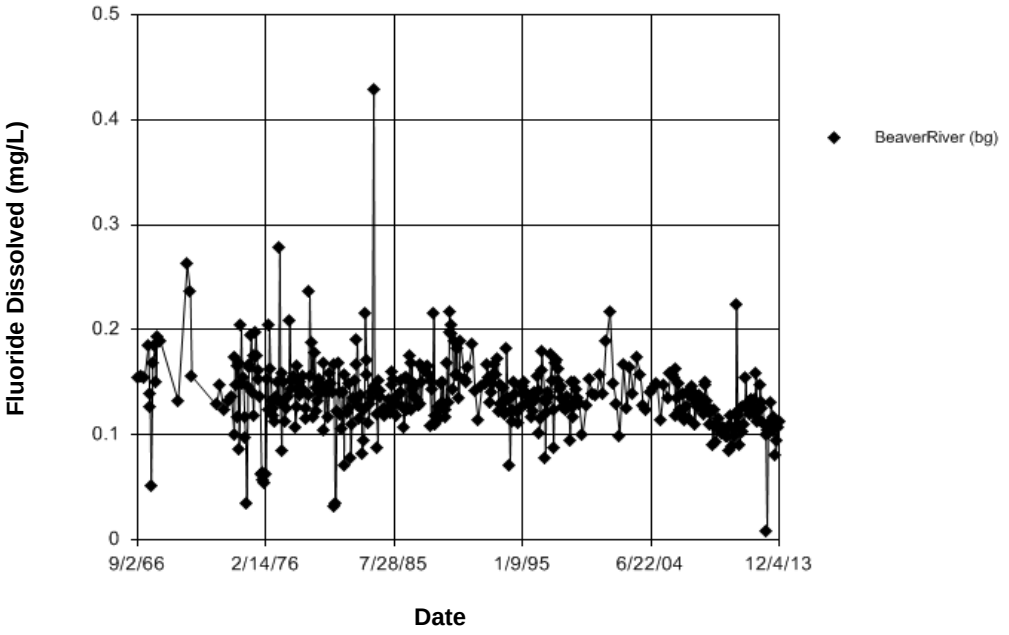


Figure C19 Beaver River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.936
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 71 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.936
Adjusted Kruskal-Wallis statistic (H') = 1.936

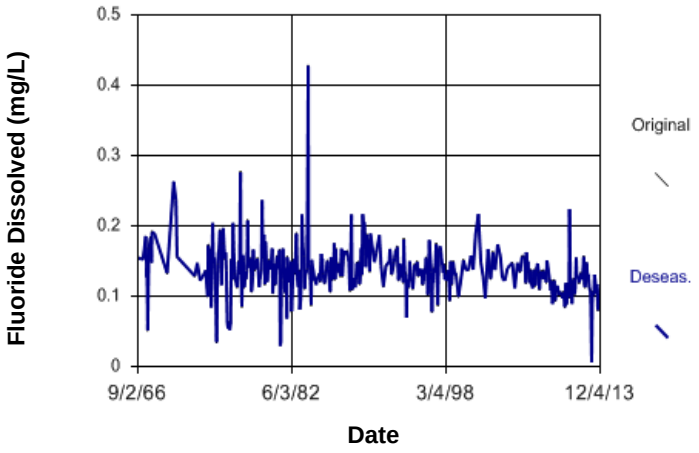


Figure C20 Beaver River: Fluoride Dissolved

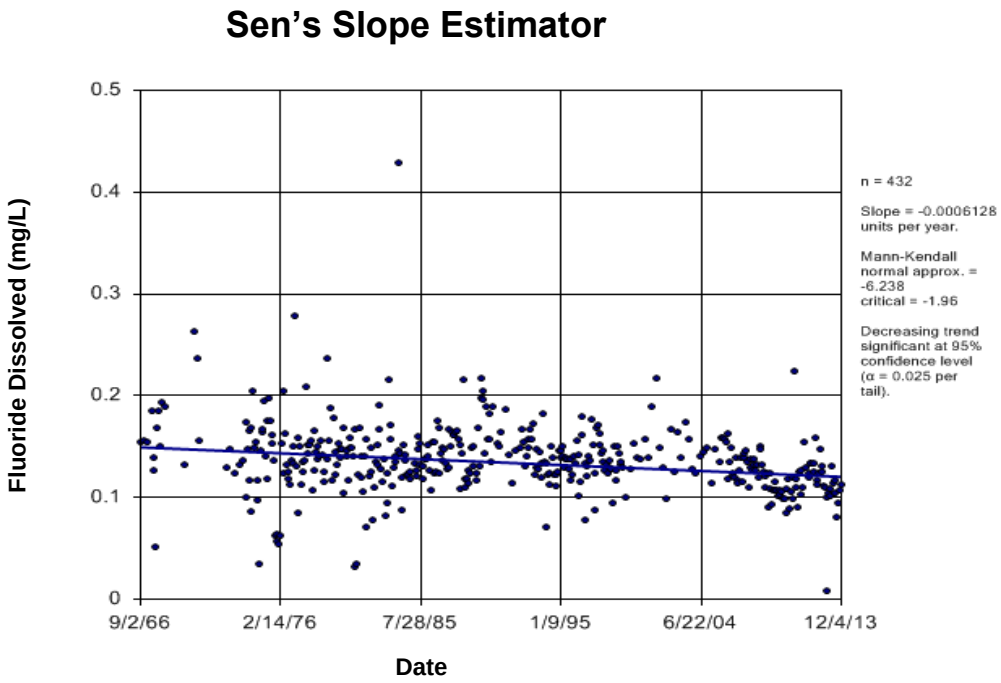


Figure C21 Beaver River: Fluoride Dissolved

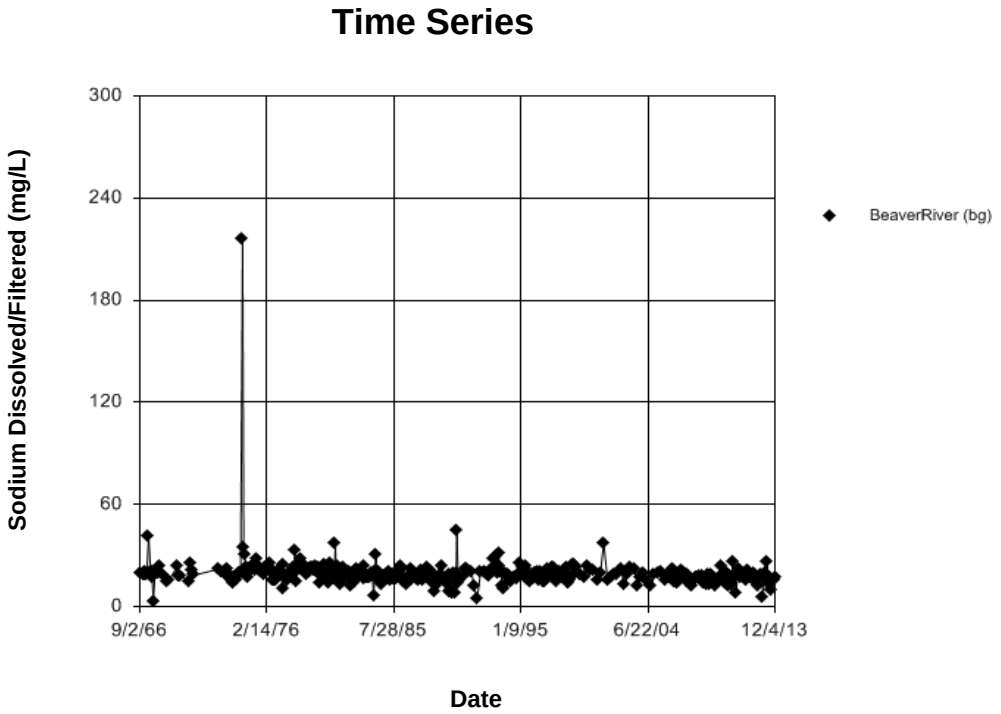


Figure C22 Beaver River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 40.3
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 52 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 40.3
Adjusted Kruskal-Wallis statistic (H') = 40.3

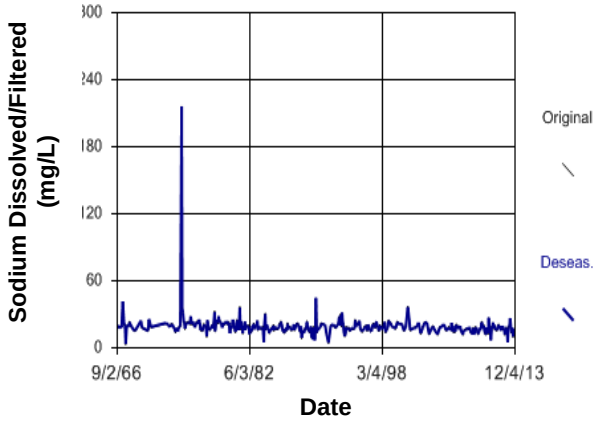


Figure C23 Beaver River: Sodium Dissolved/Filtered

Seasonal Kendall

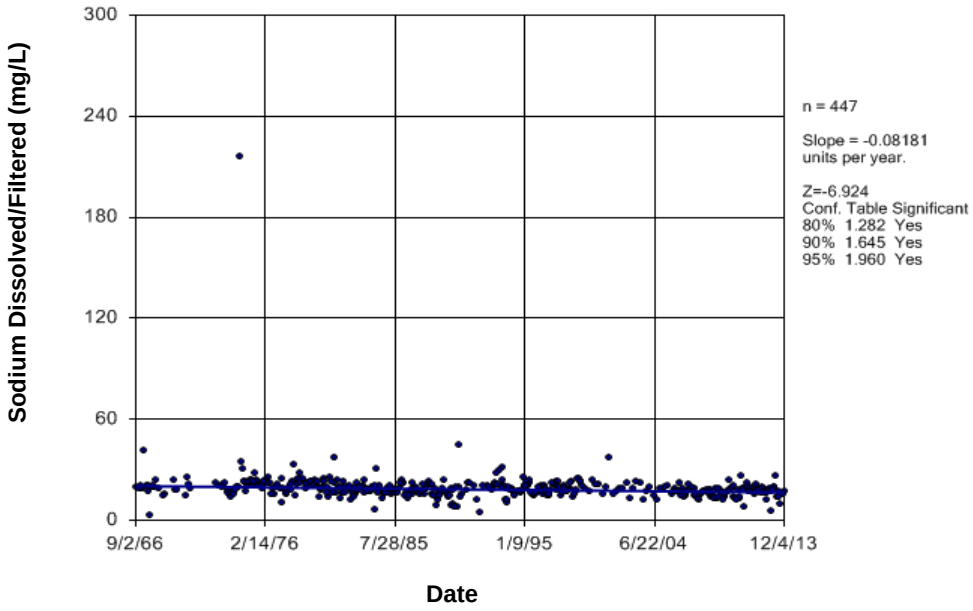


Figure C24 Beaver River: Sodium Dissolved/Filtered

Time Series

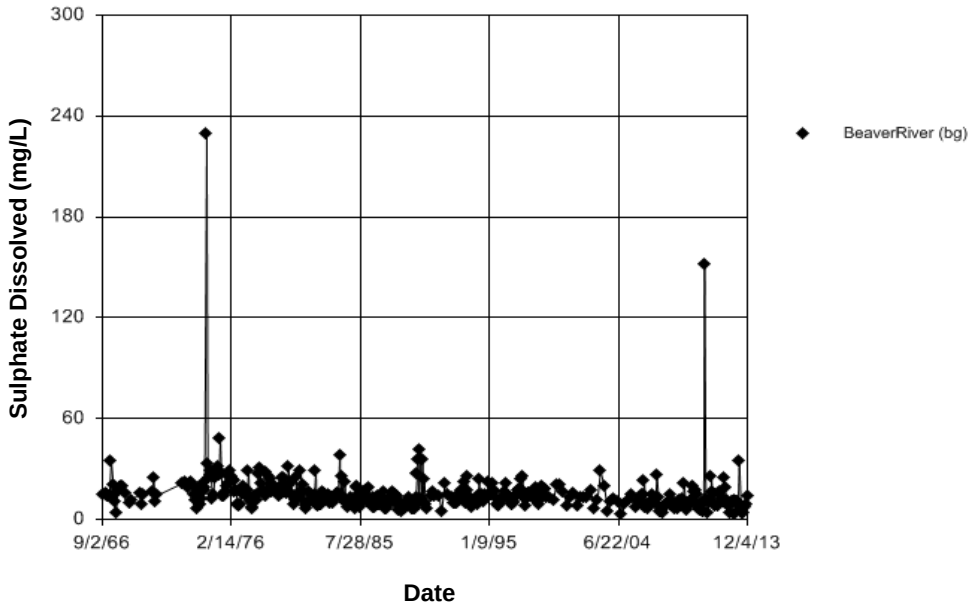


Figure C25 Beaver River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 23.76
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 24 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 23.76
Adjusted Kruskal-Wallis statistic (H') = 23.76

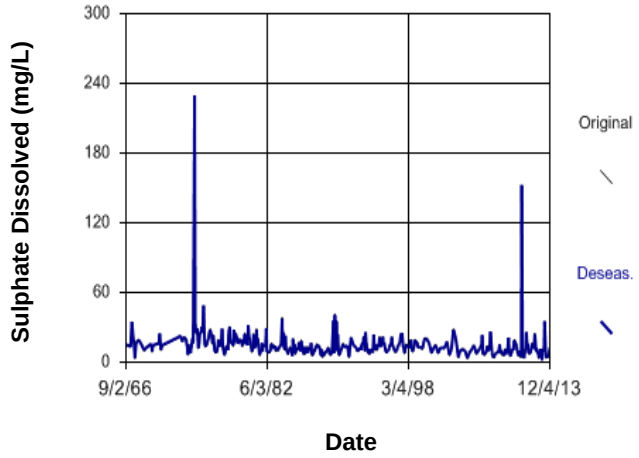


Figure C26 Beaver River: Sulphate Dissolved

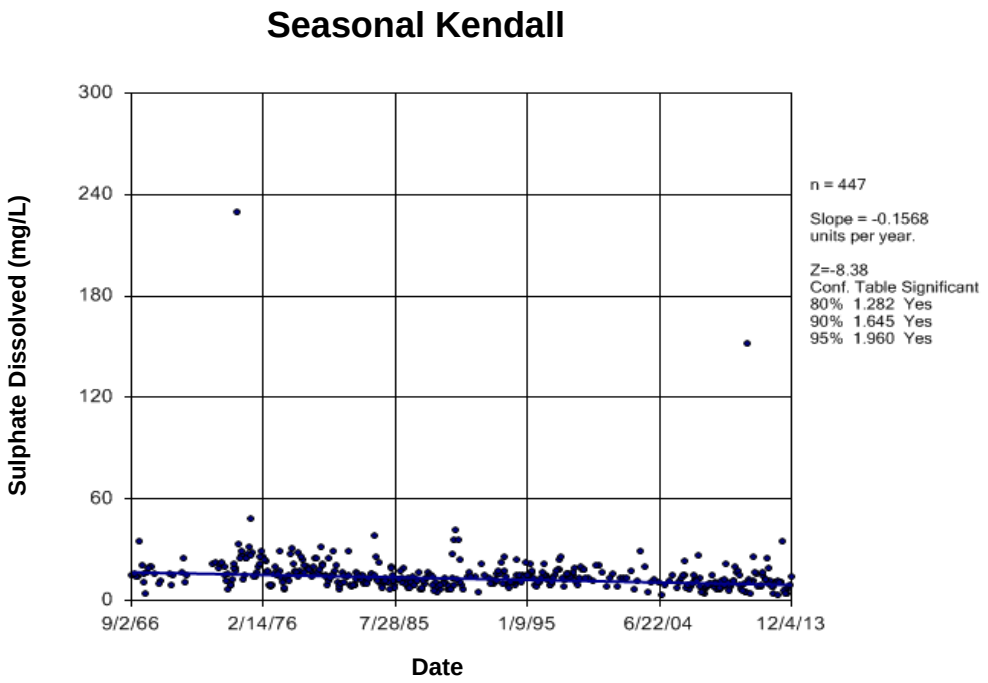


Figure C27 Beaver River: Sulphate Dissolved

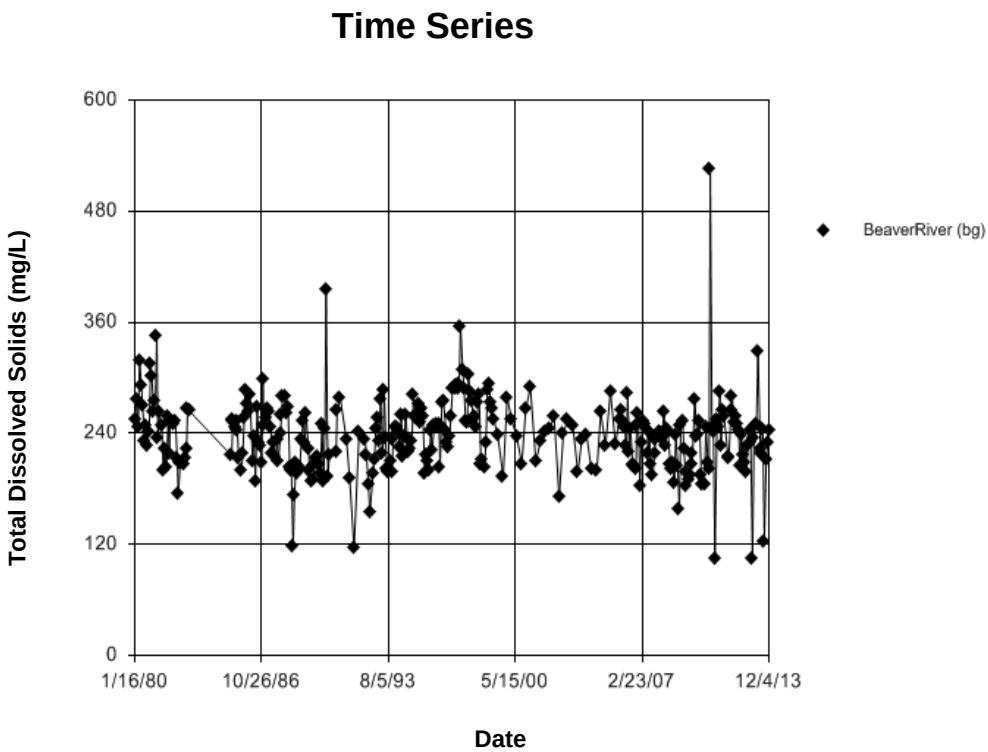


Figure C28 Beaver River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 51.25
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 27 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 51.25
Adjusted Kruskal-Wallis statistic (H') = 51.25

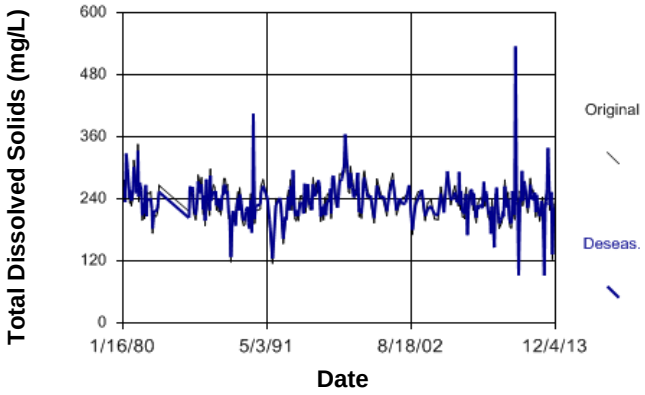


Figure C29 Beaver River: Total Dissolved Solids

Seasonal Kendall

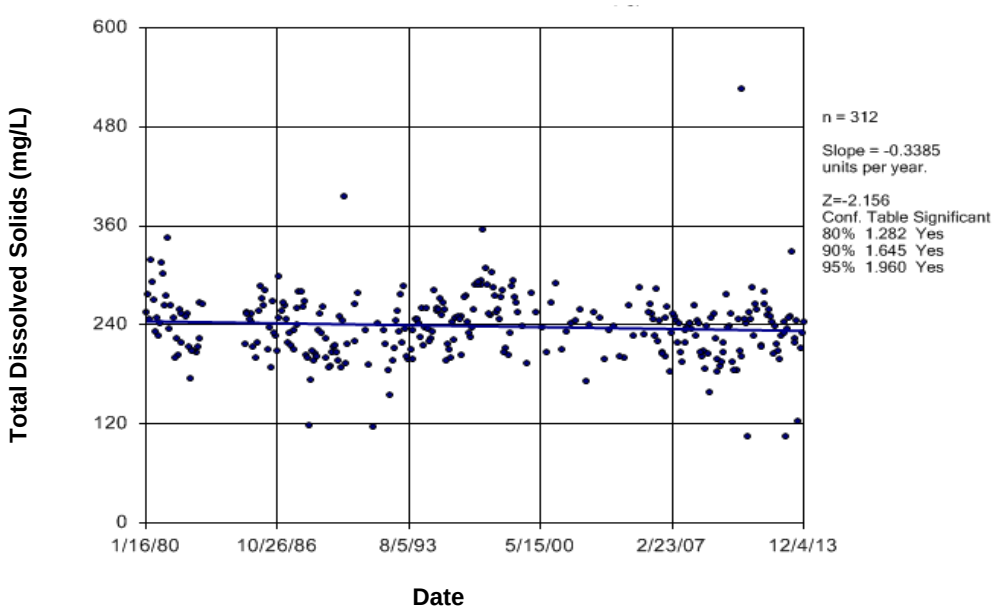


Figure C30 Beaver River: Total Dissolved Solids

Time Series

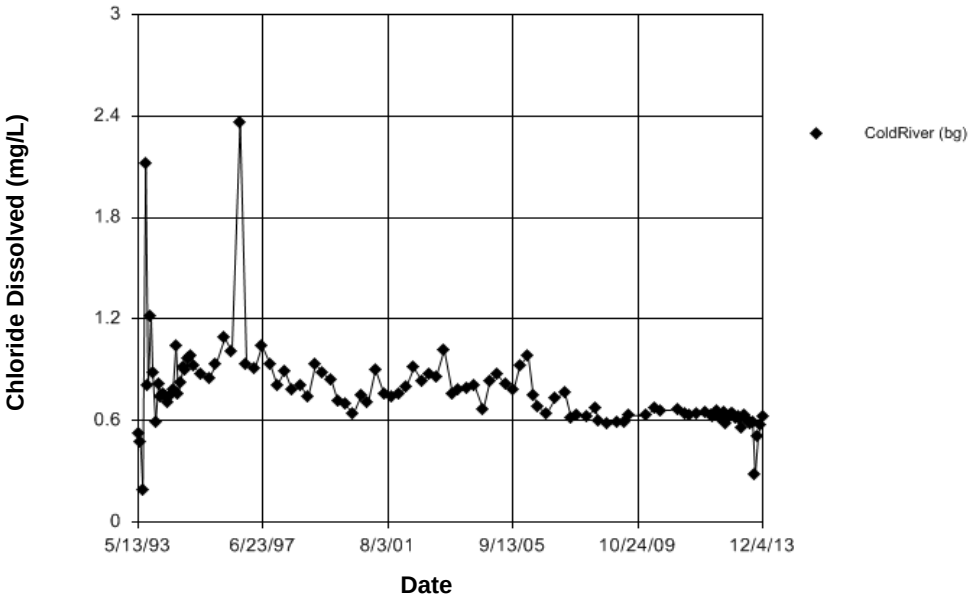


Figure C31 Cold River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.315
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.315
Adjusted Kruskal-Wallis statistic (H') = 4.315

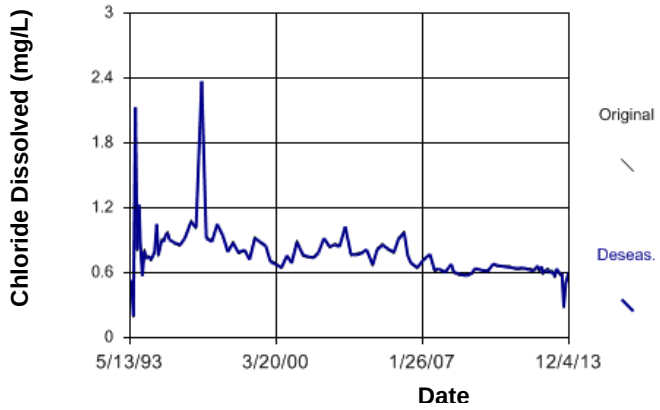


Figure C32 Cold River: Chloride Dissolved

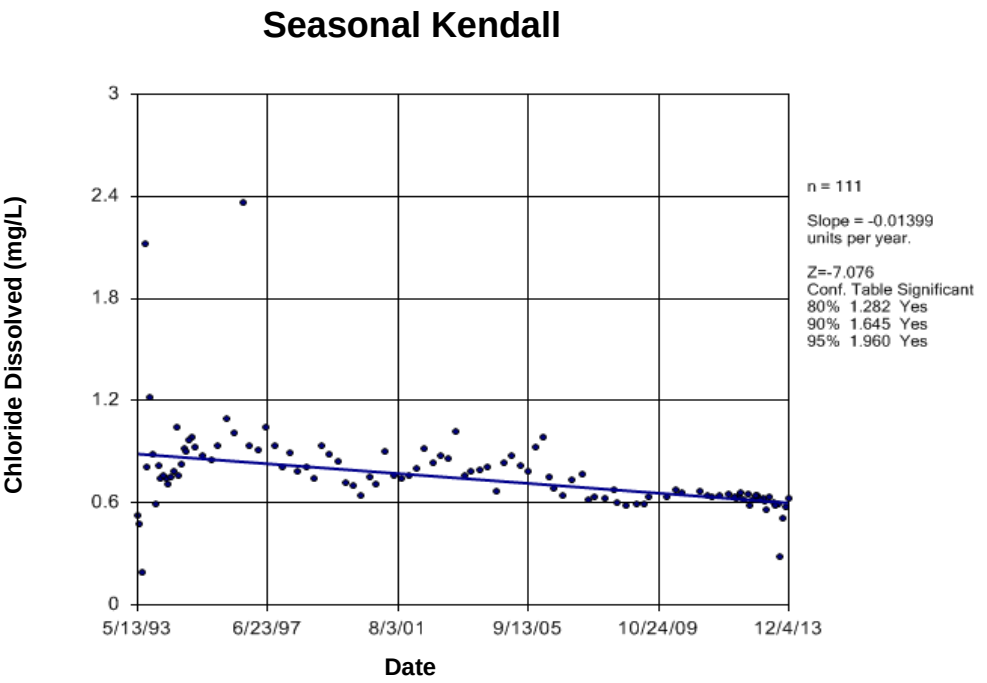


Figure C33 Cold River: Chloride Dissolved

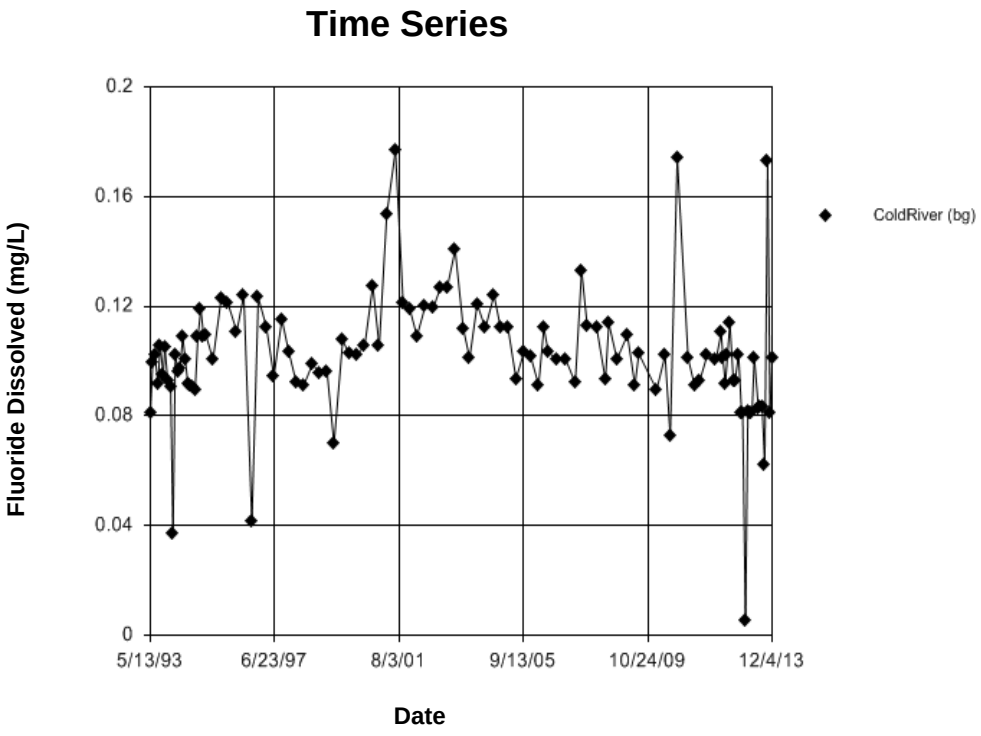


Figure C34 Cold River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1097
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1097
Adjusted Kruskal-Wallis statistic (H') = 0.1097

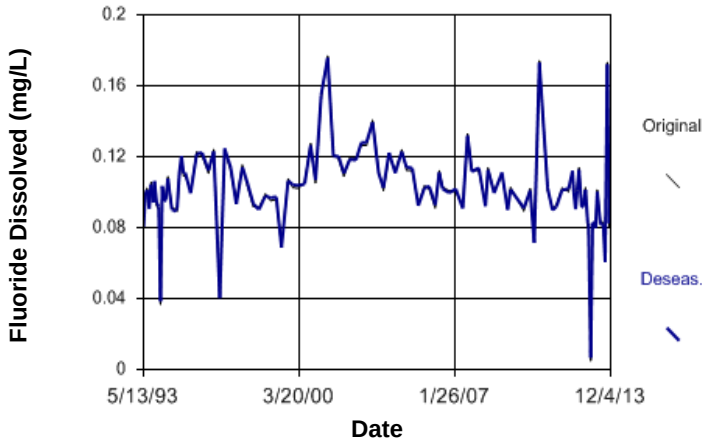


Figure C35 Cold River: Fluoride Dissolved

Sen's Slope Estimator

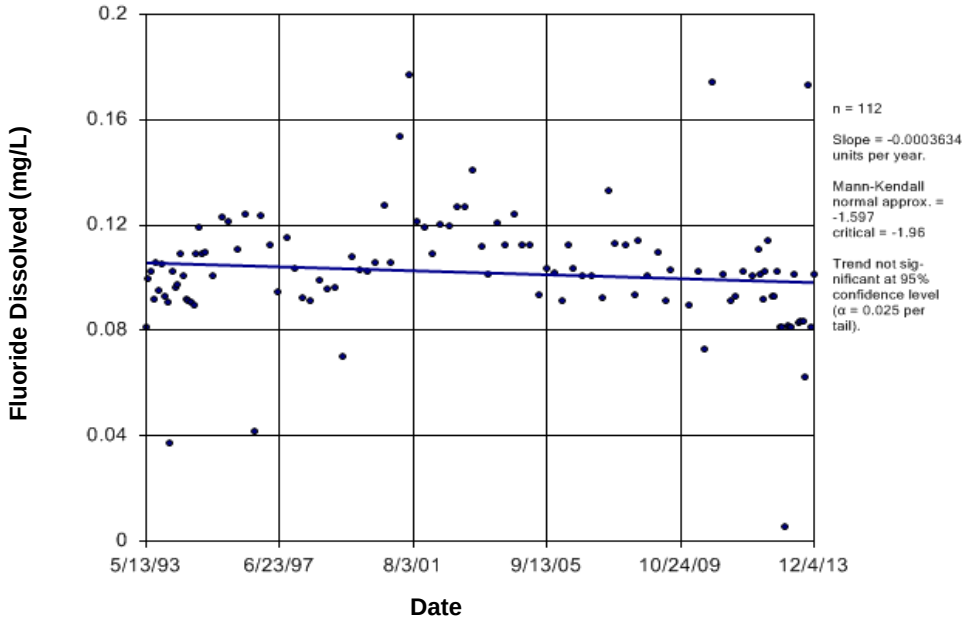


Figure C36 Cold River: Fluoride Dissolved

Time Series

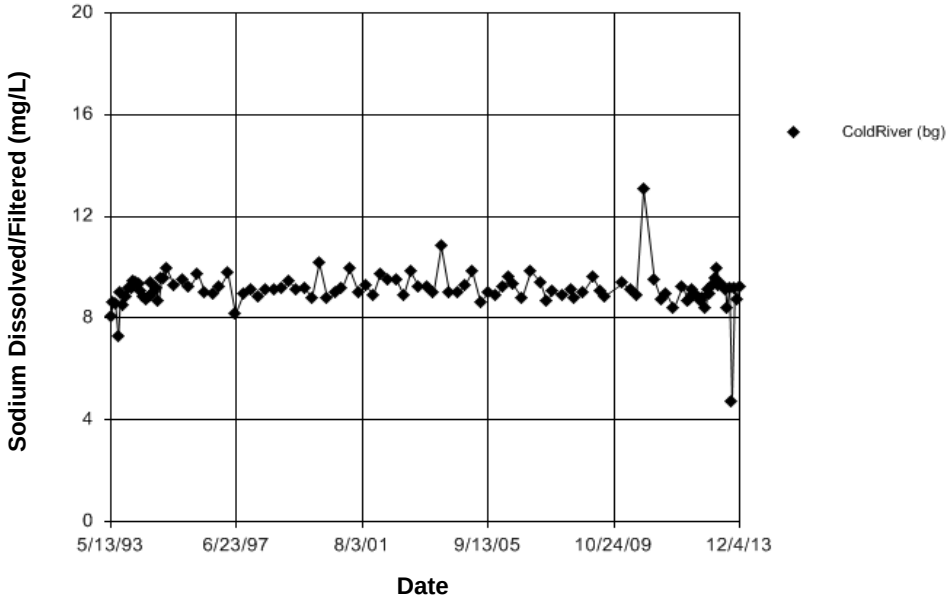


Figure C37 Cold River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 18.08
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 18.08
Adjusted Kruskal-Wallis statistic (H') = 18.08

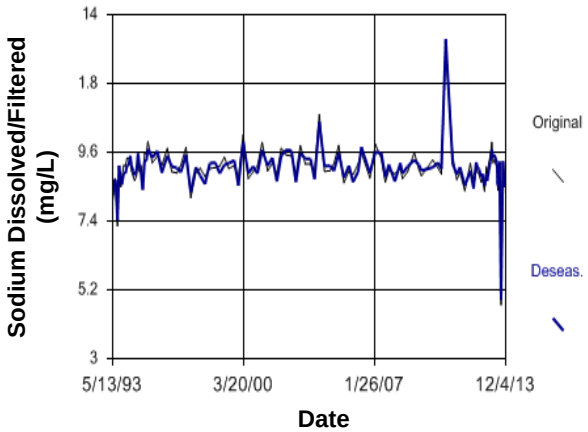


Figure C38 Cold River: Sodium Dissolved/Filtered

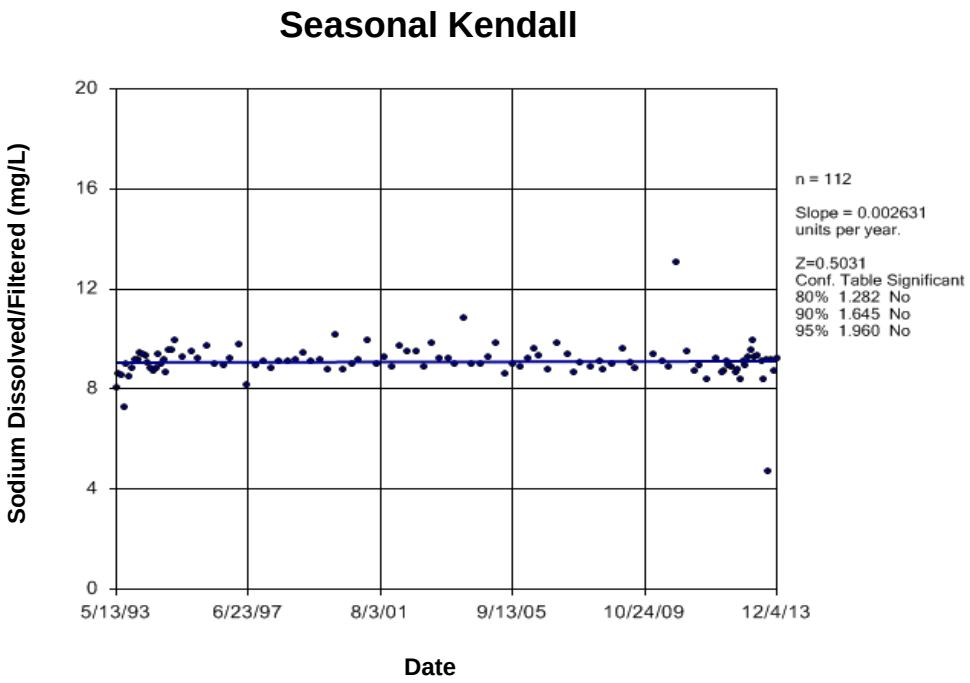


Figure C39 Cold River: Sodium Dissolved/Filtered

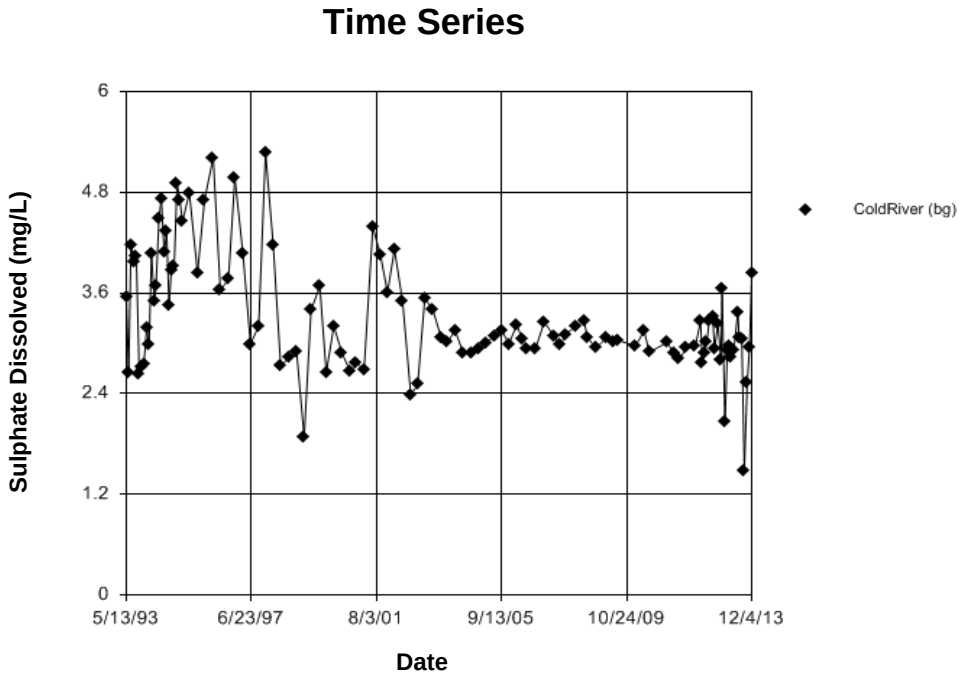


Figure C40 Cold River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.4698
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.4698
Adjusted Kruskal-Wallis statistic (H') = 0.4698

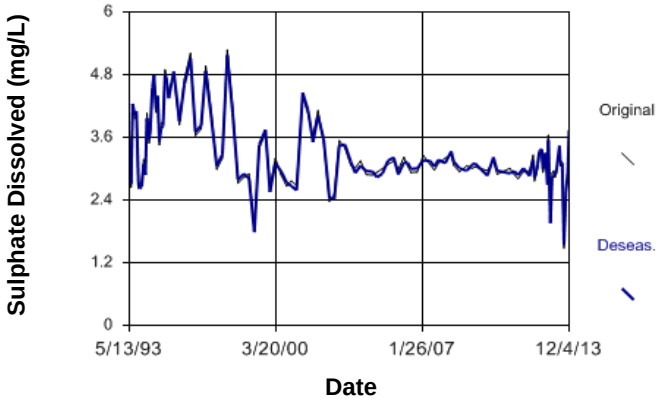


Figure C41 Cold River: Sulphate Dissolved

Sen's Slope Estimator

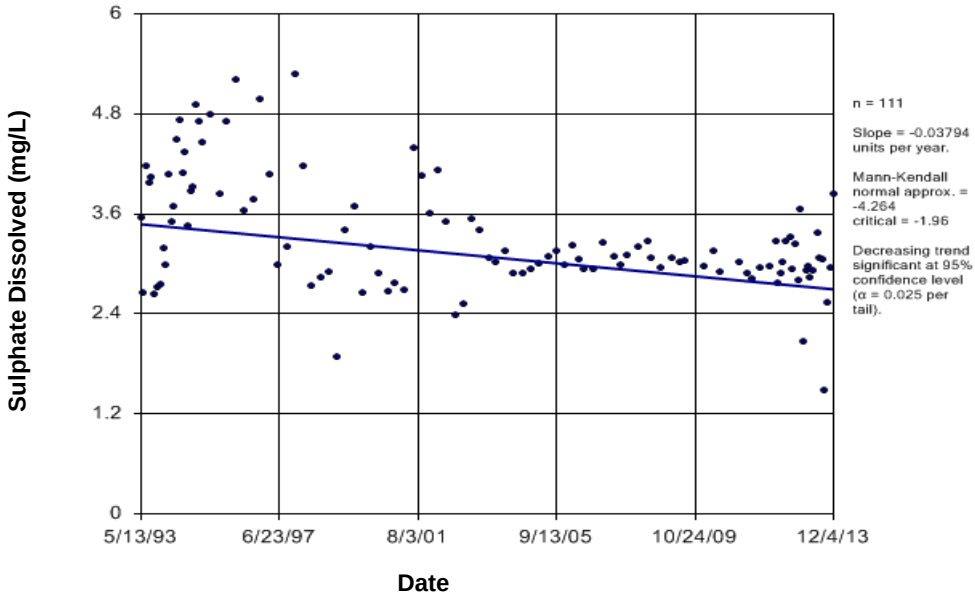


Figure C42 Cold River: Sulphate Dissolved

Time Series

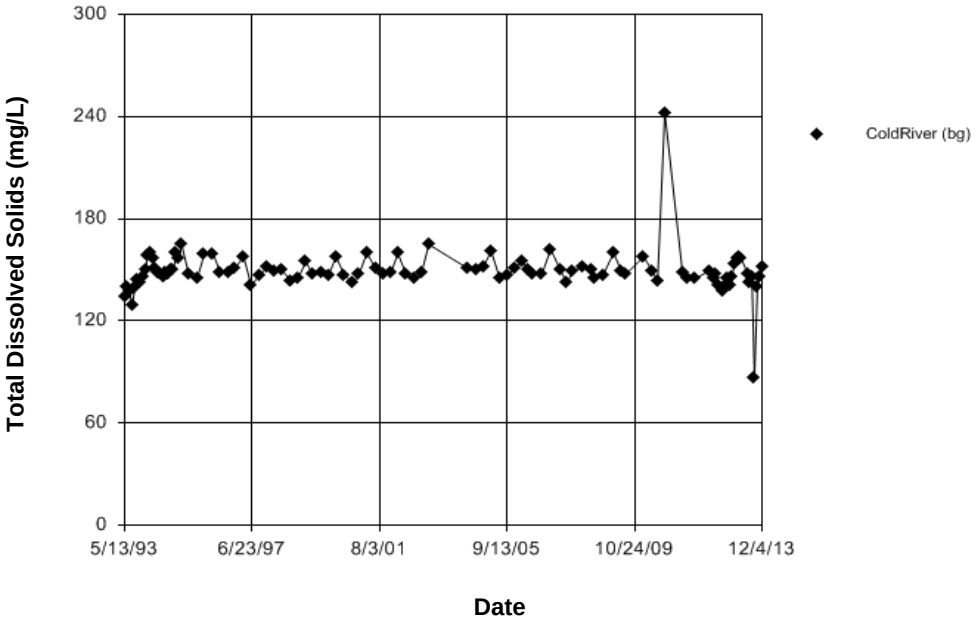


Figure C43 Cold River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 33.34
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 24 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 33.33
Adjusted Kruskal-Wallis statistic (H') = 33.34

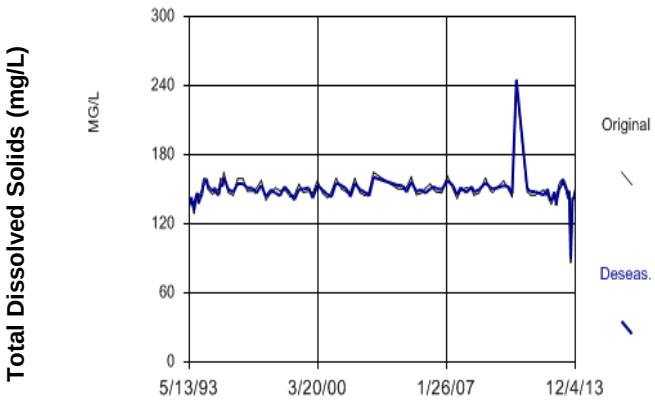


Figure C44 Cold River: Total Dissolved Solids

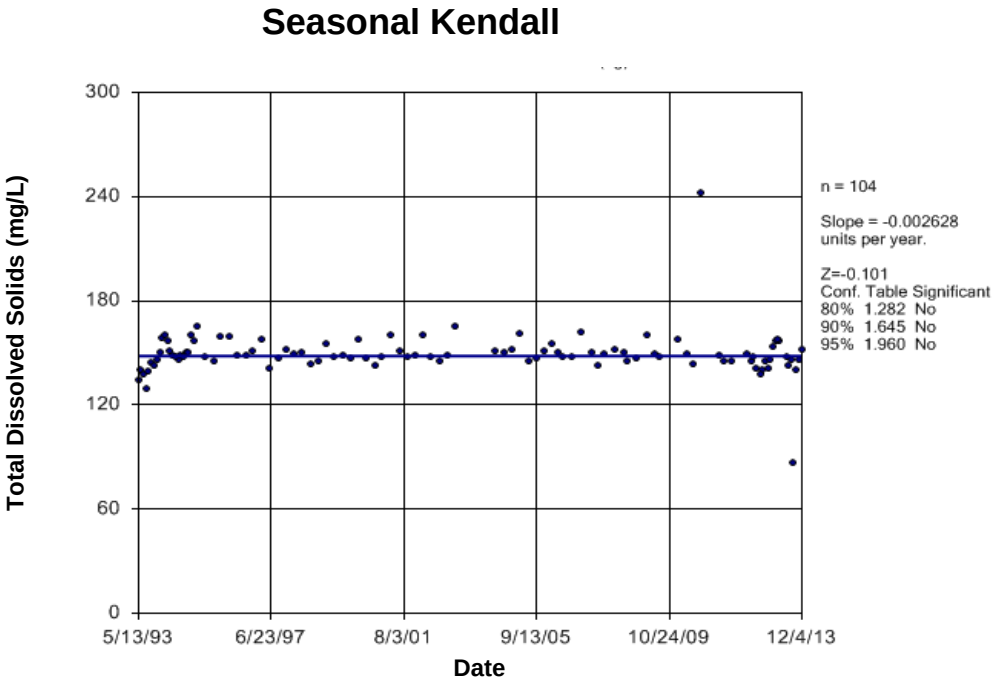


Figure C45 Cold River: Total Dissolved Solids

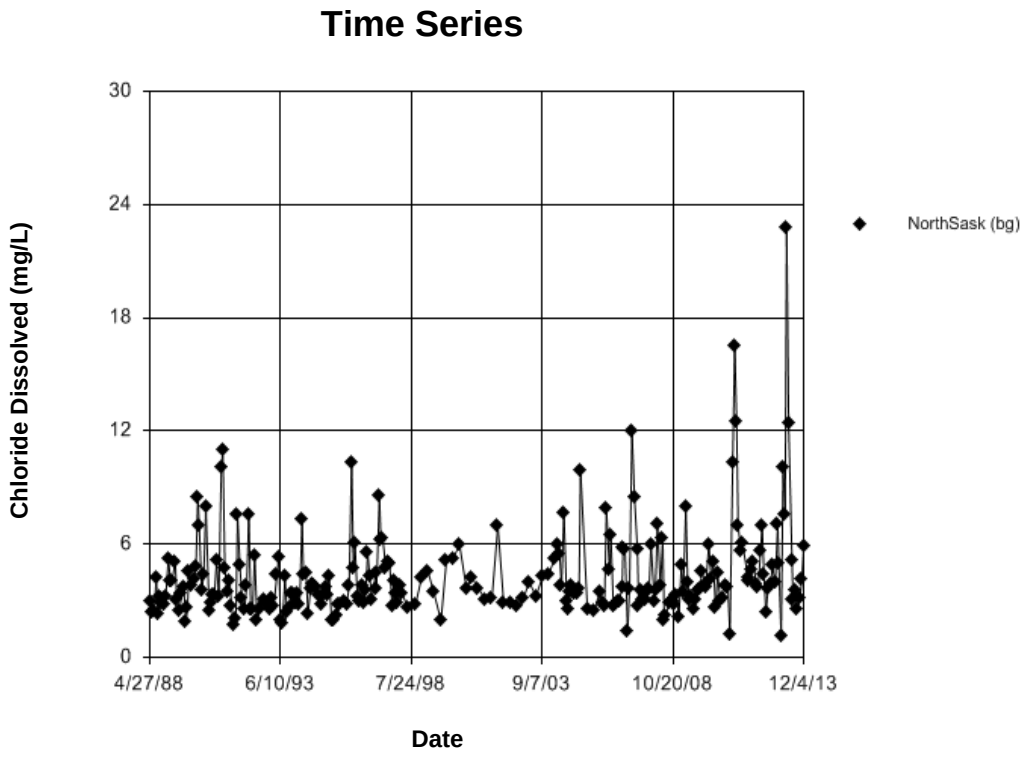


Figure C46 North Saskatchewan River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 8.076
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.076
Adjusted Kruskal-Wallis statistic (H') = 8.076

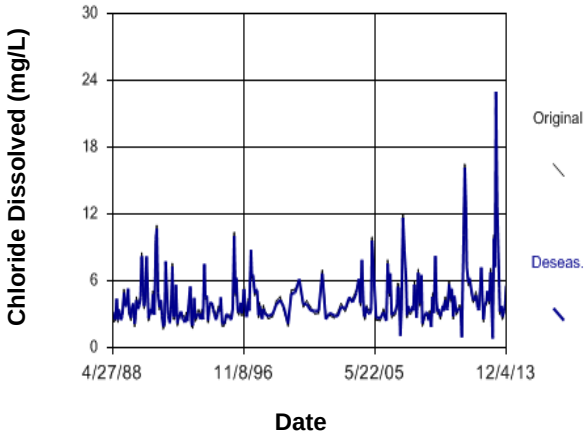


Figure C47 North Saskatchewan River: Chloride Dissolved

Seasonal Kendall

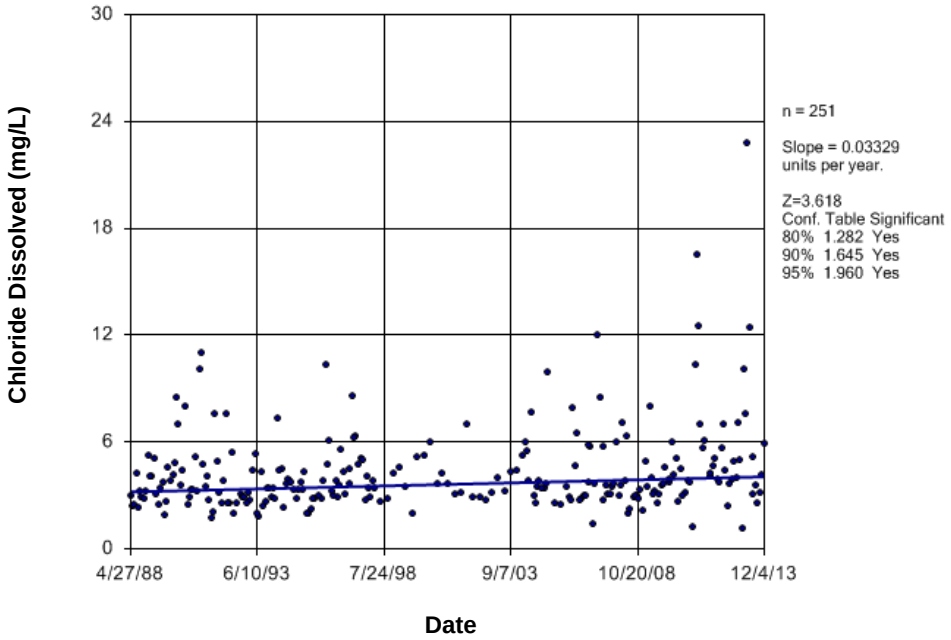


Figure C48 North Saskatchewan River: Chloride Dissolved

Time Series

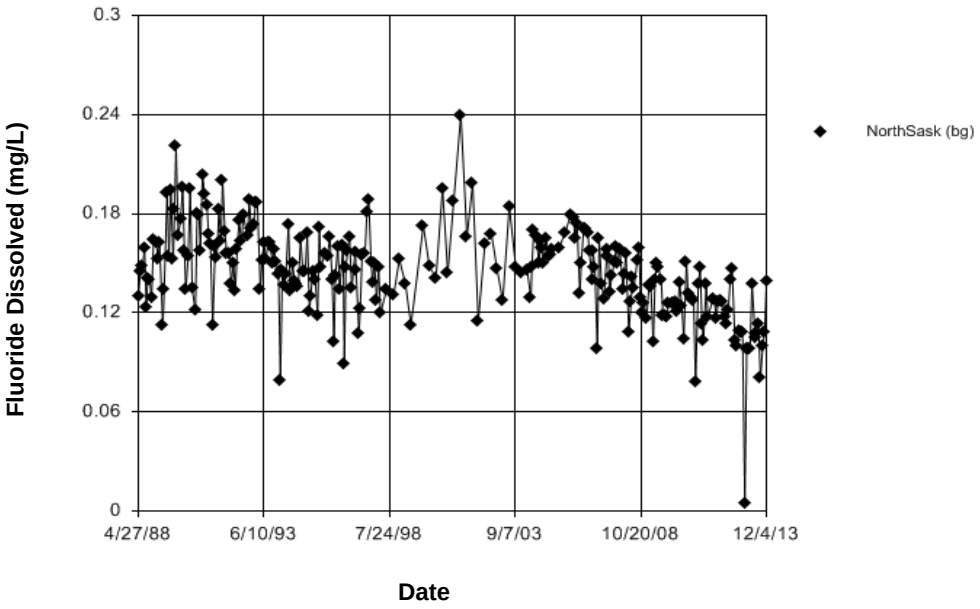


Figure C49 North Saskatchewan River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.8927
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 27 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.8927
Adjusted Kruskal-Wallis statistic (H') = 0.8927

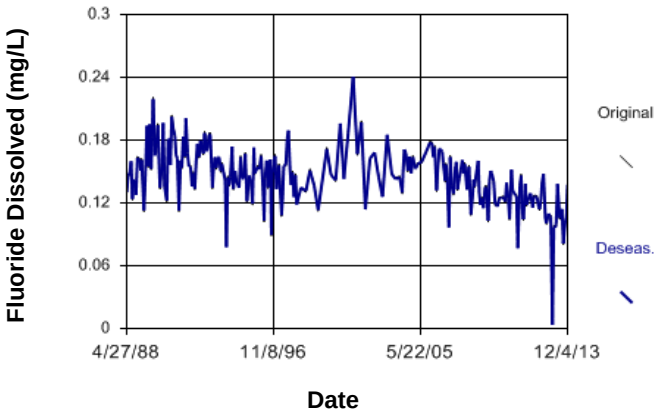


Figure C50 North Saskatchewan River: Fluoride Dissolved

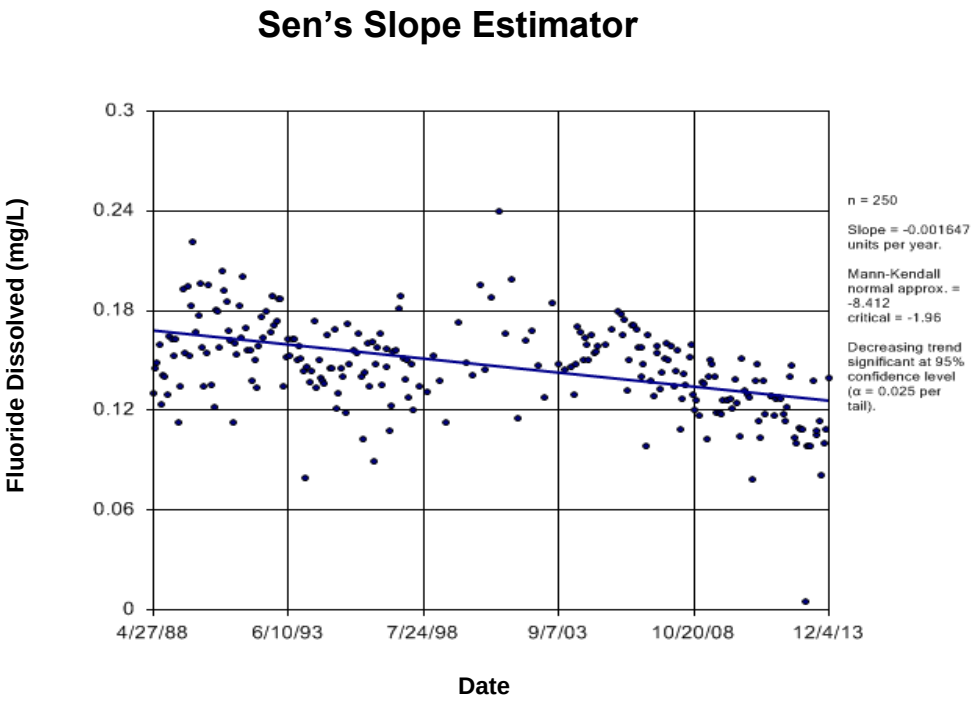


Figure C51 North Saskatchewan River: Fluoride Dissolved

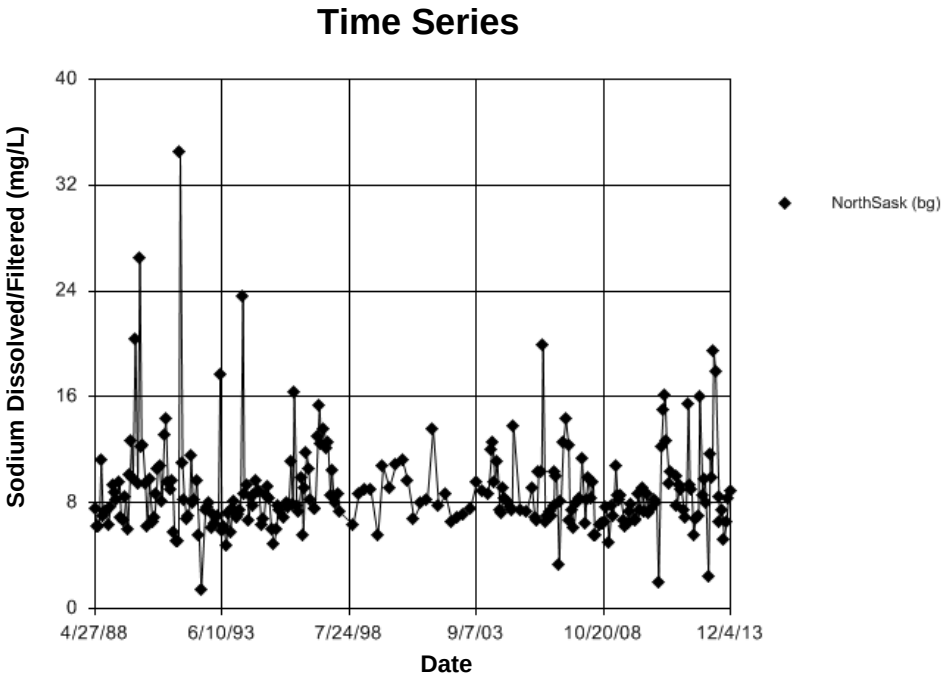


Figure C52 North Saskatchewan River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.891
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.891
Adjusted Kruskal-Wallis statistic (H') = 1.891

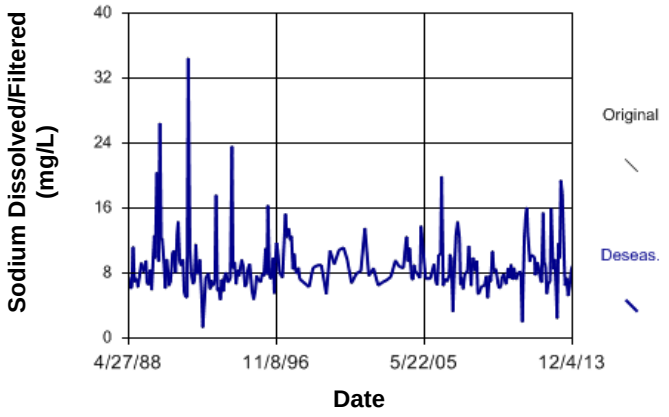


Figure C53 North Saskatchewan River: Sodium Dissolved/Filtered

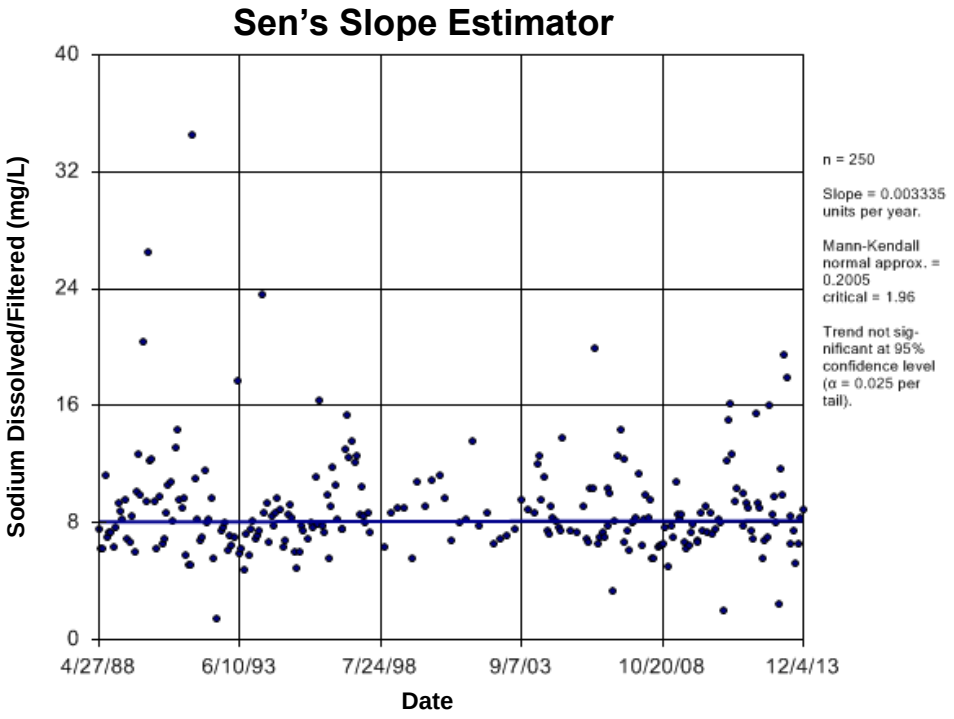


Figure C54 North Saskatchewan River: Sodium Dissolved/Filtered

Time Series

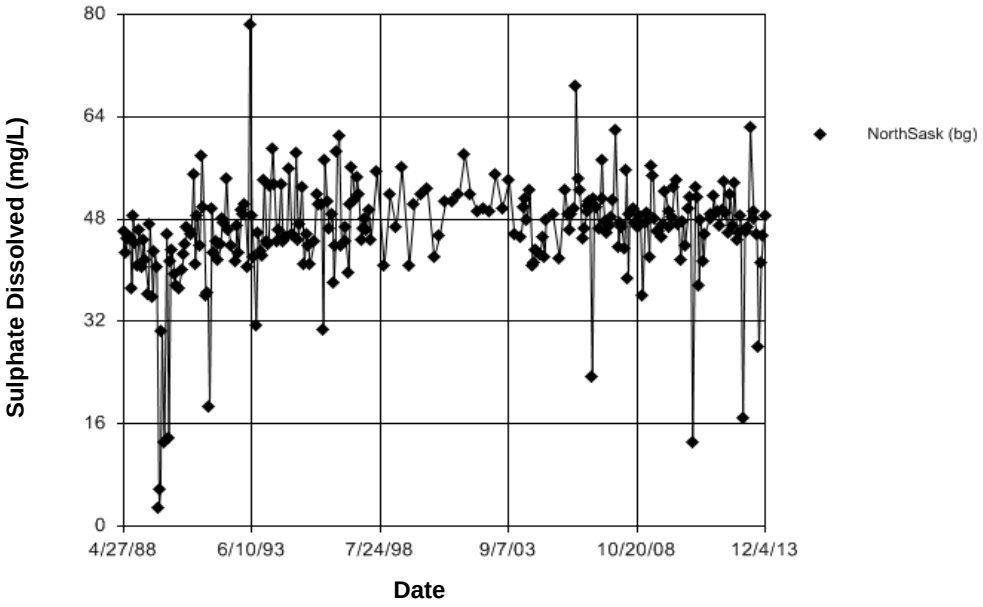


Figure C55 North Saskatchewan River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.02
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 19 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.02
Adjusted Kruskal-Wallis statistic (H') = 1.02

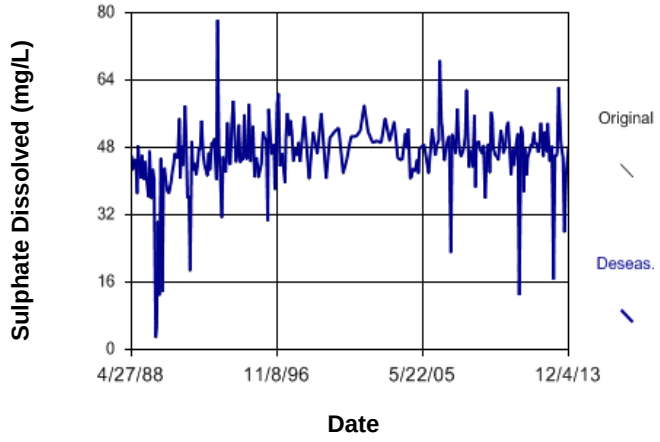


Figure C56 North Saskatchewan River: Sulphate Dissolved

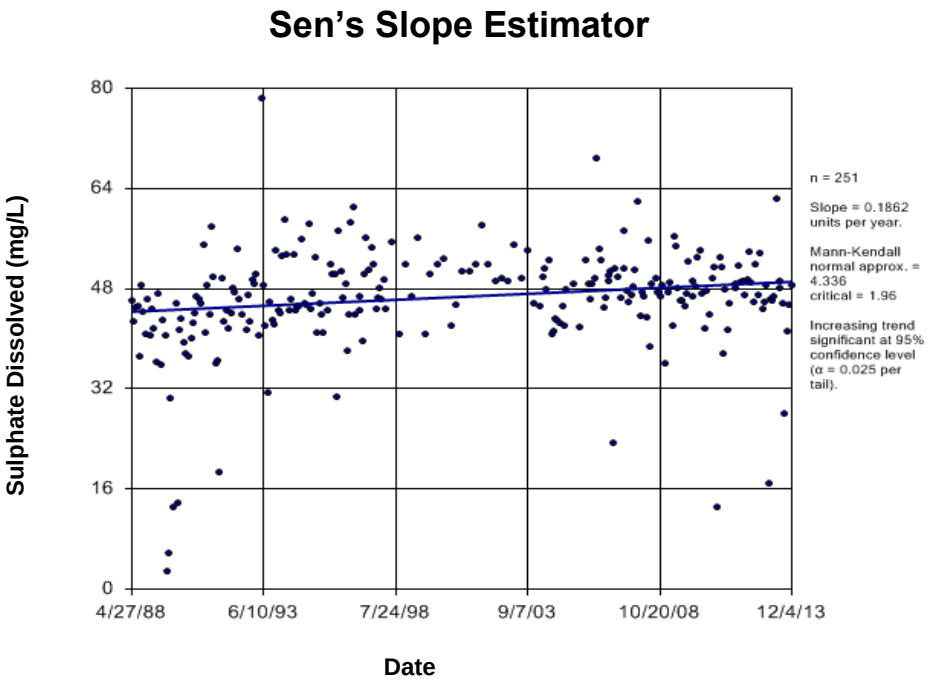


Figure C57 North Saskatchewan River: Sulphate Dissolved

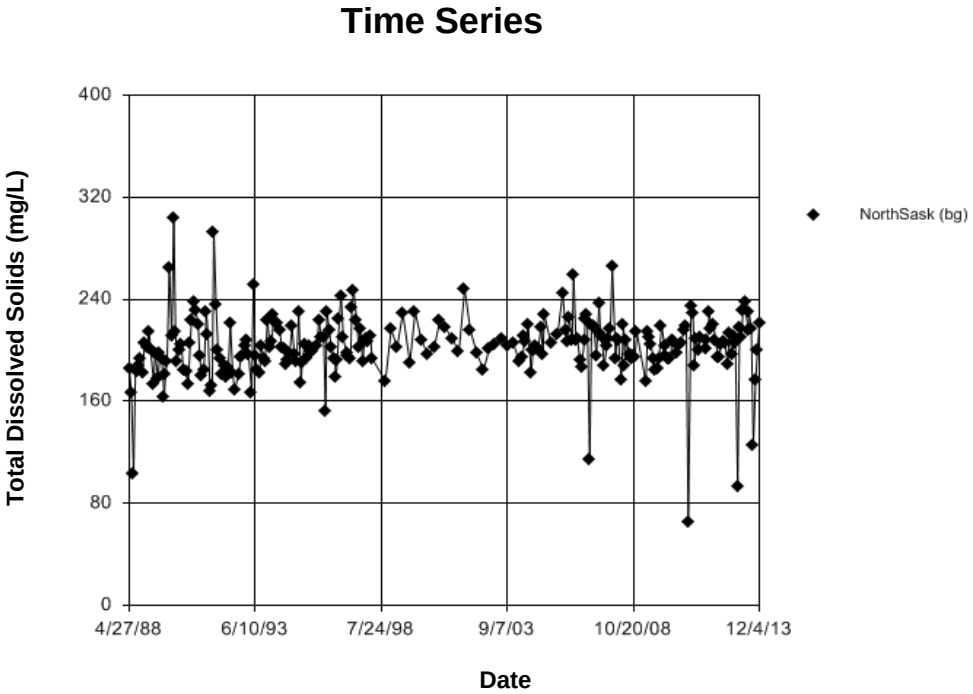


Figure C58 North Saskatchewan River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 24.92
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 33 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 24.92
Adjusted Kruskal-Wallis statistic (H') = 24.92

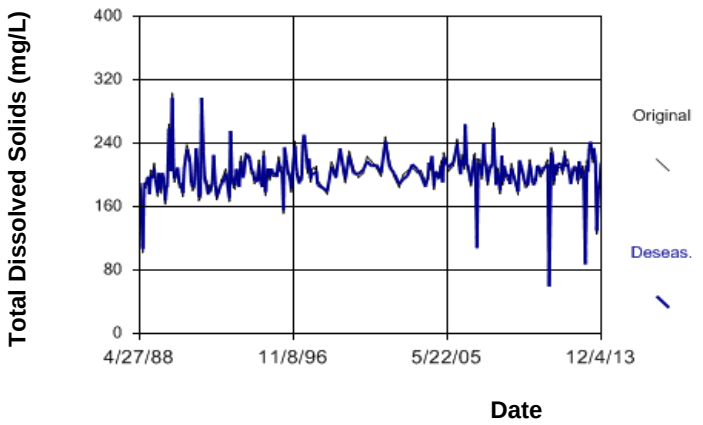


Figure C59 North Saskatchewan River: Total Dissolved Solids

Seasonal Kendall

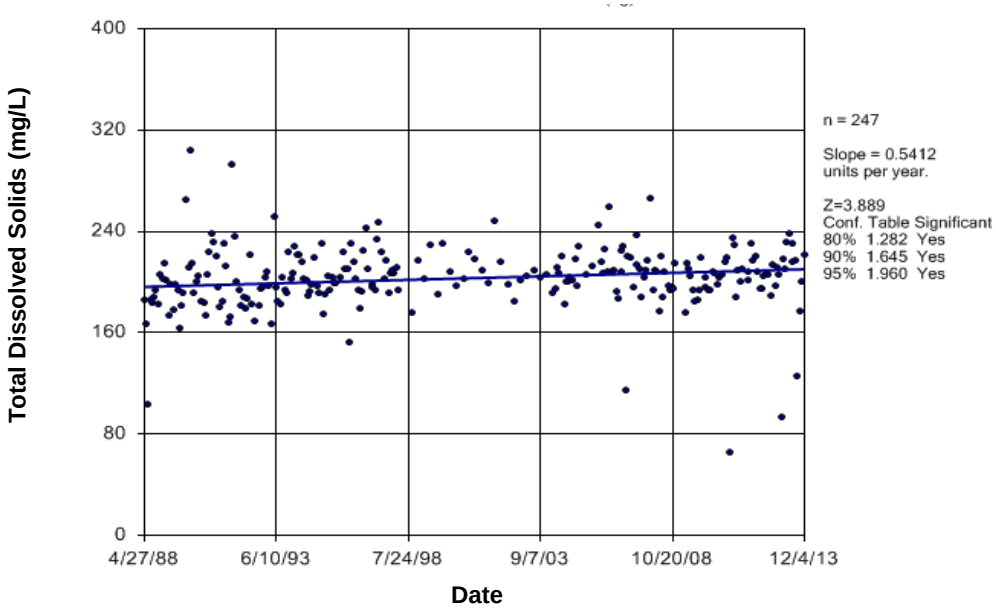


Figure C60 North Saskatchewan River: Total Dissolved Solids

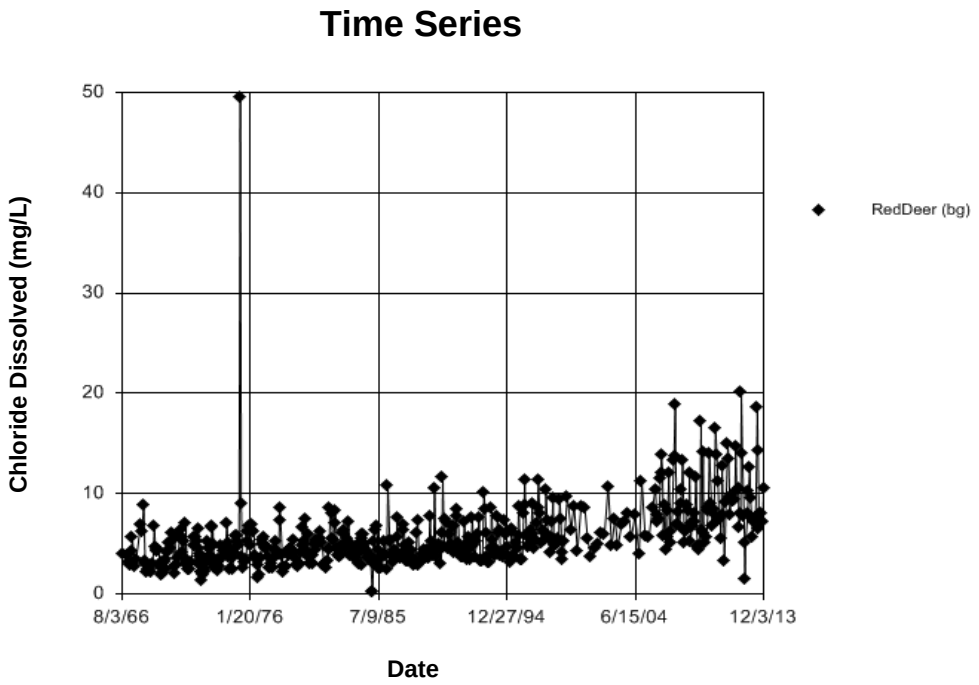


Figure C61 Red Deer River (AB-SK): Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 9.398
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 9.398
Adjusted Kruskal-Wallis statistic (H') = 9.398

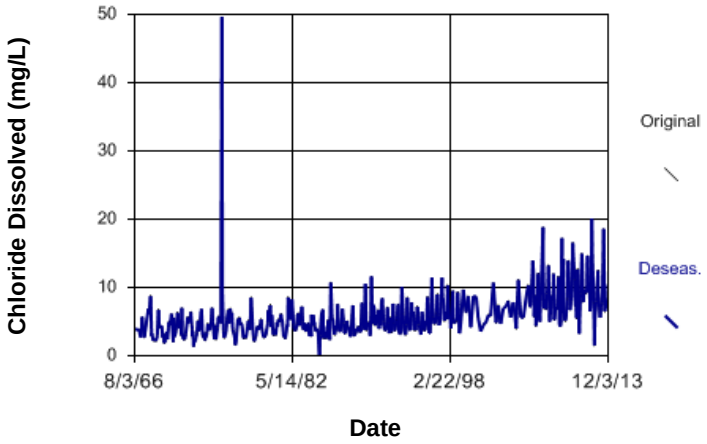


Figure C62 Red Deer River (AB-SK): Chloride Dissolved

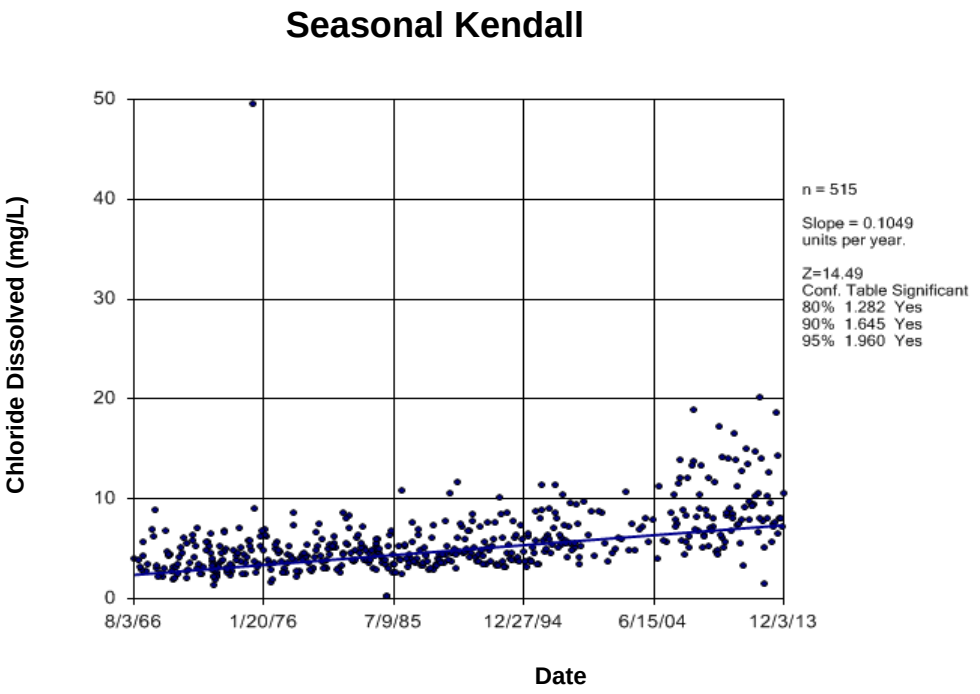


Figure C63 Red Deer River (AB-SK): Chloride Dissolved

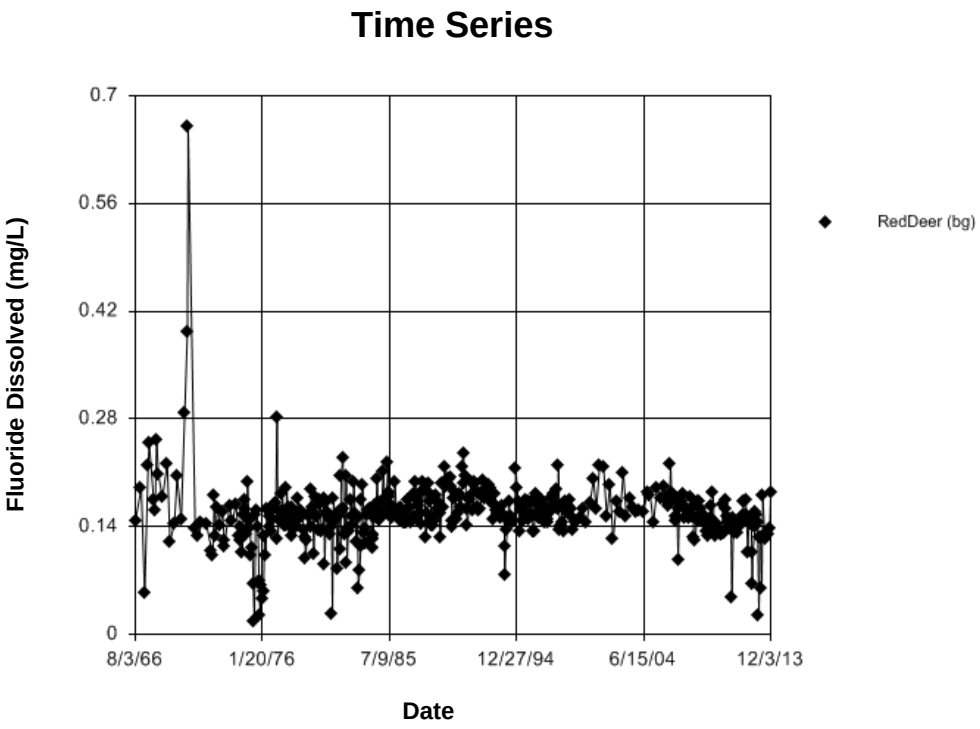


Figure C64 Red Deer River (AB-SK): Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7653
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 80 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7653
Adjusted Kruskal-Wallis statistic (H') = 0.7653

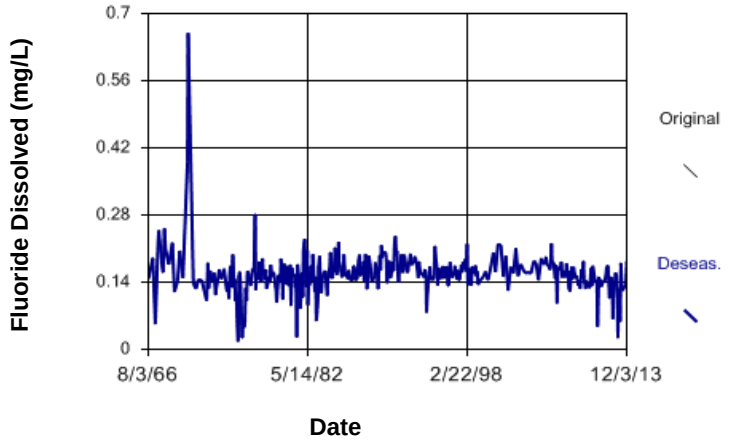


Figure C65 Red Deer River (AB-SK): Fluoride Dissolved

Sen's Slope Estimator

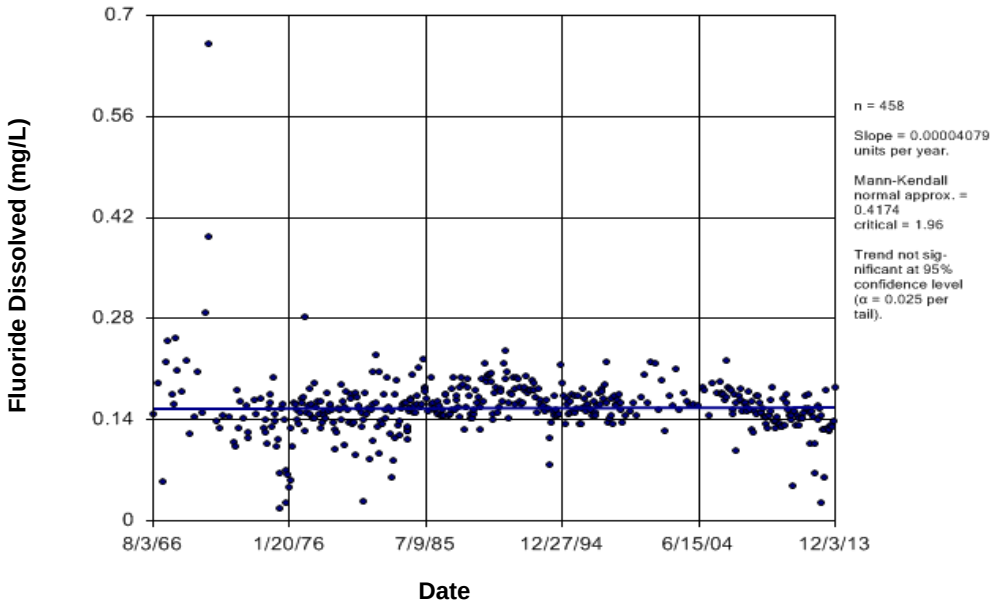


Figure C66 Red Deer River (AB-SK): Fluoride Dissolved

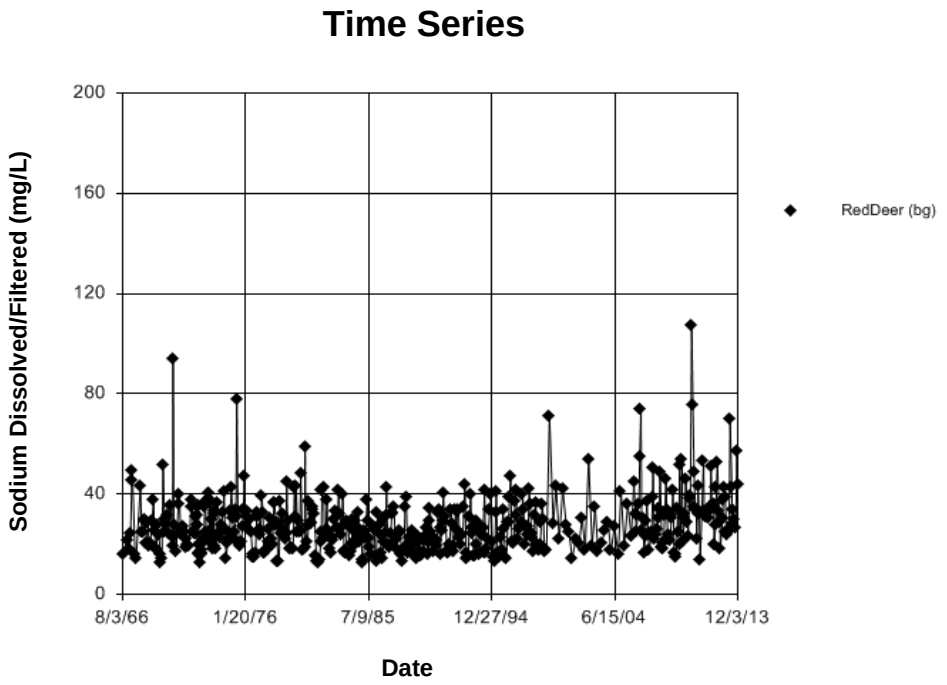


Figure C67 Red Deer River (AB-SK): Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.346
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 34 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.346
Adjusted Kruskal-Wallis statistic (H') = 2.346

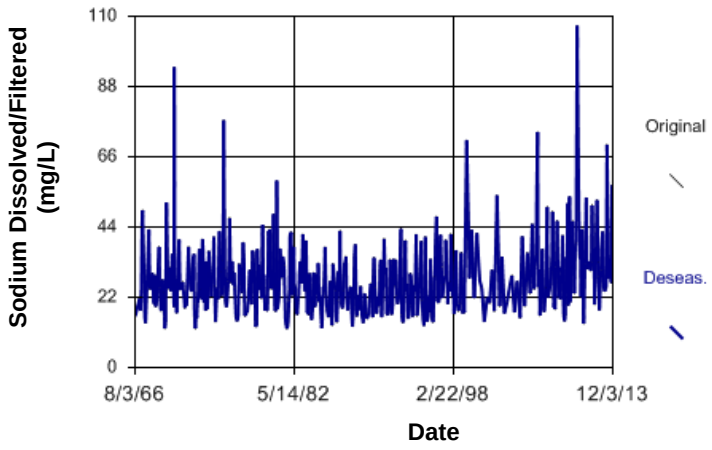


Figure C68 Red Deer River (AB-SK): Sodium Dissolved/Filtered

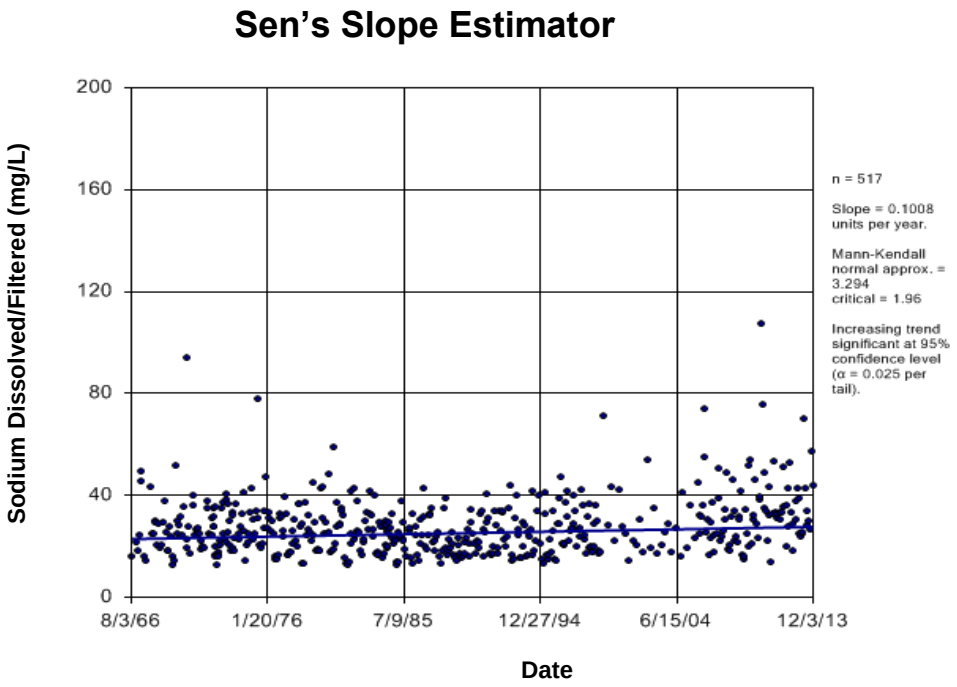


Figure C69 Red Deer River (AB-SK): Sodium Dissolved/Filtered

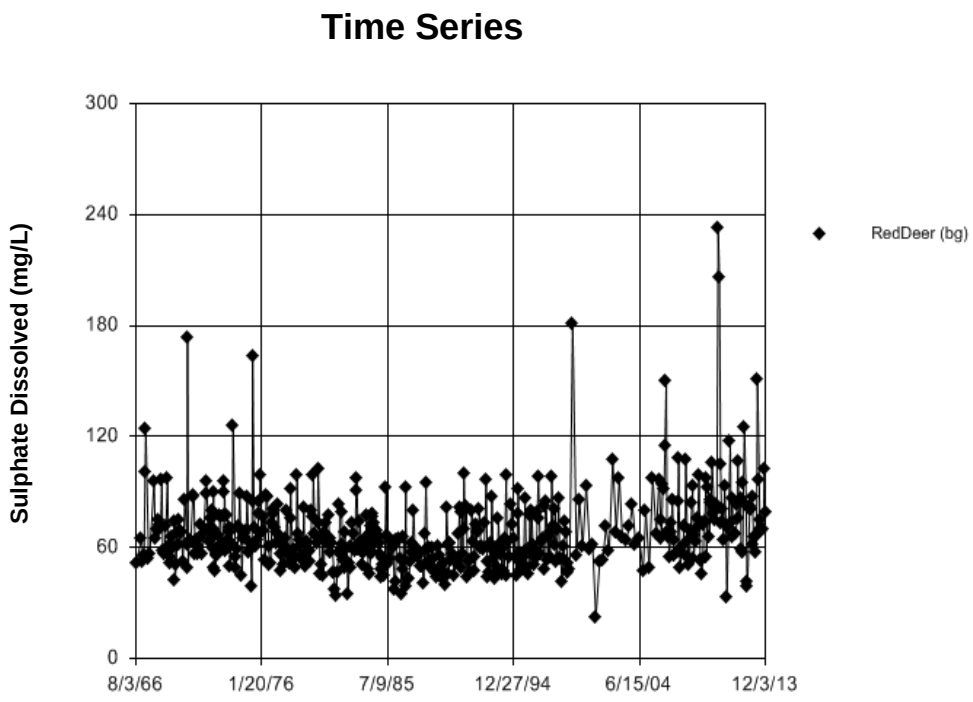


Figure C70 Red Deer River (AB-SK): Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.294
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 16 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.294
Adjusted Kruskal-Wallis statistic (H') = 1.294

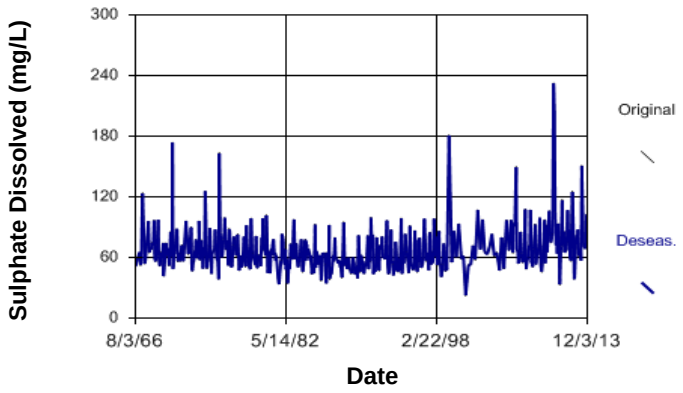


Figure C71 Red Deer River (AB-SK): Sulphate Dissolved

Sen's Slope Estimator

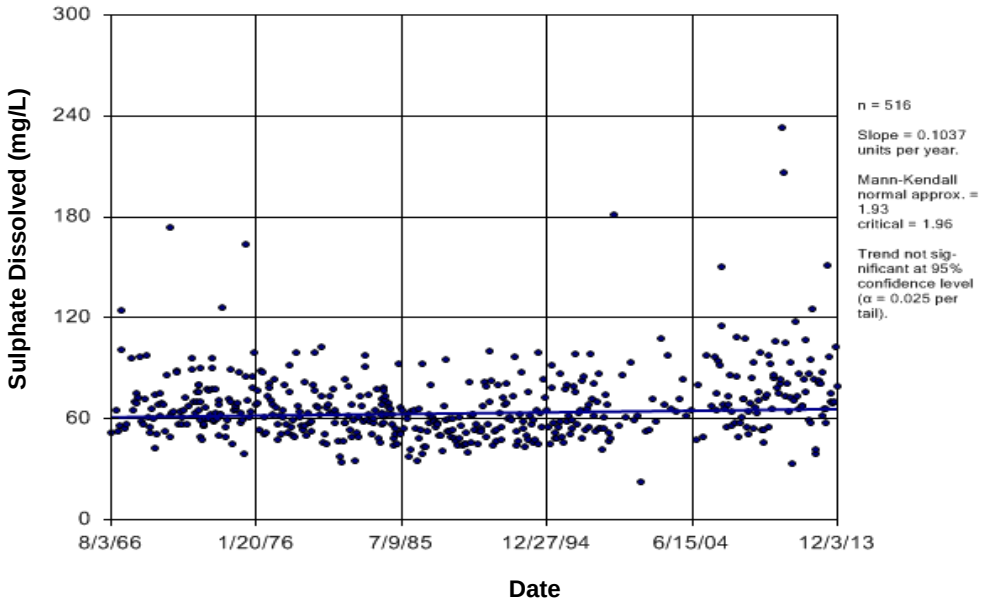


Figure C72 Red Deer River (AB-SK): Sulphate Dissolved

Time Series

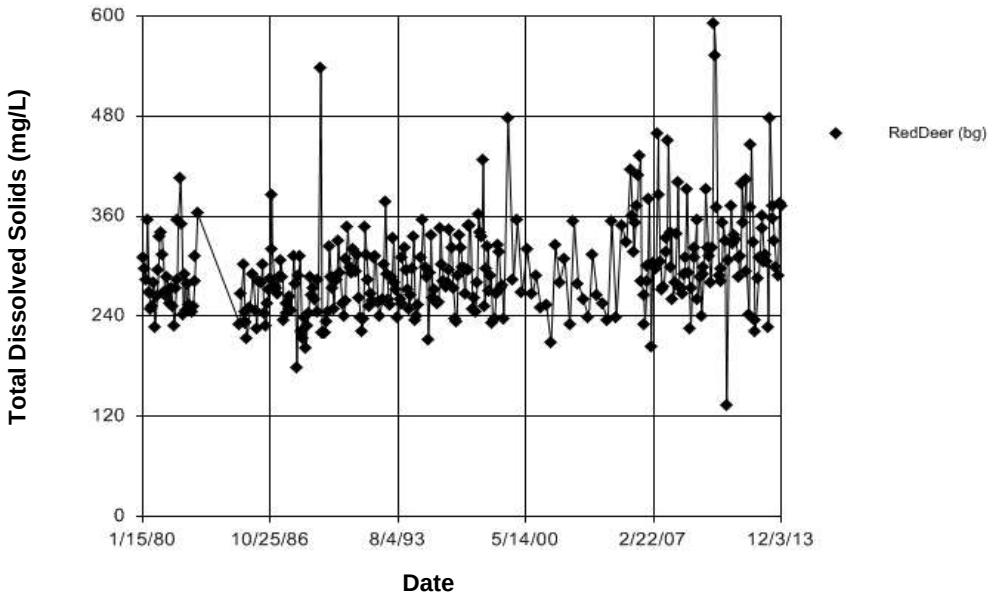


Figure C73 Red Deer River (AB-SK): Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 16.65
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 29 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 16.65
Adjusted Kruskal-Wallis statistic (H') = 16.65

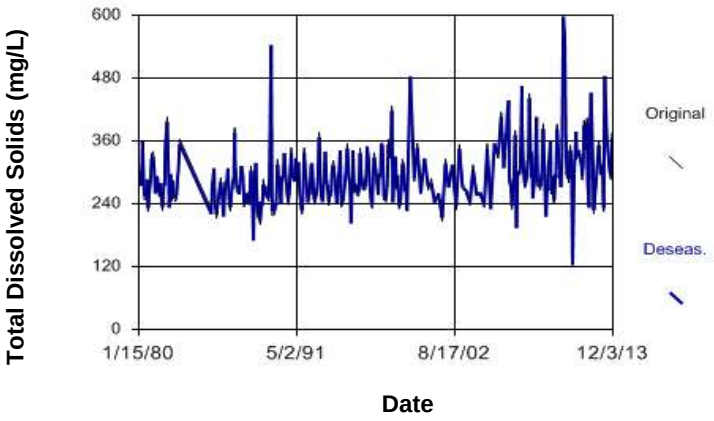


Figure C74 Red Deer River (AB-SK): Total Dissolved Solids

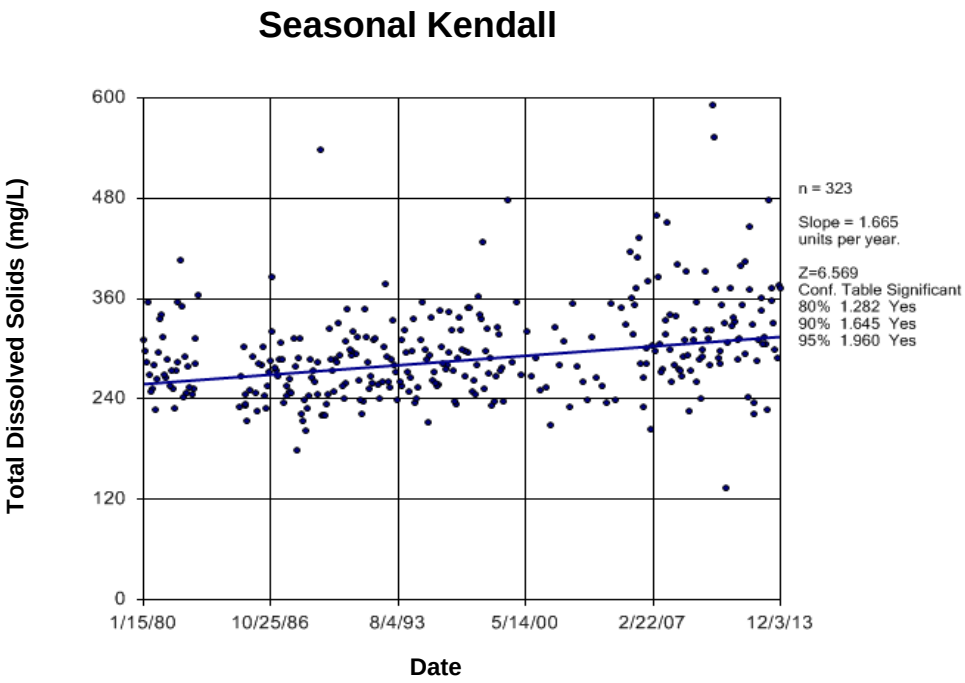


Figure C75 Red Deer River (AB-SK): Total Dissolved Solids

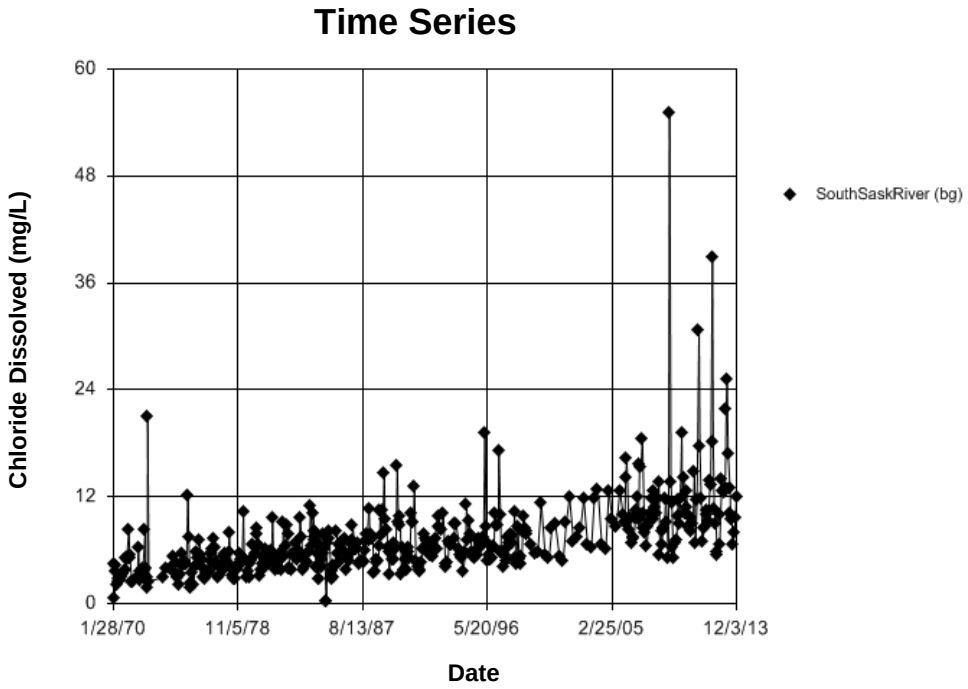


Figure C76 South Saskatchewan River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 53.4
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 13 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 53.4
Adjusted Kruskal-Wallis statistic (H') = 53.4

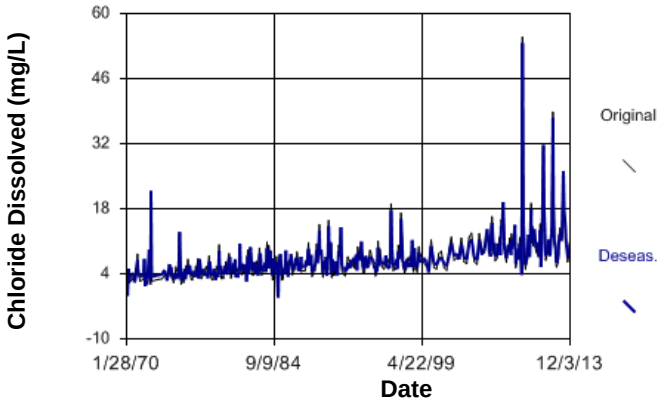


Figure C77 South Saskatchewan River: Chloride Dissolved

Seasonal Kendall

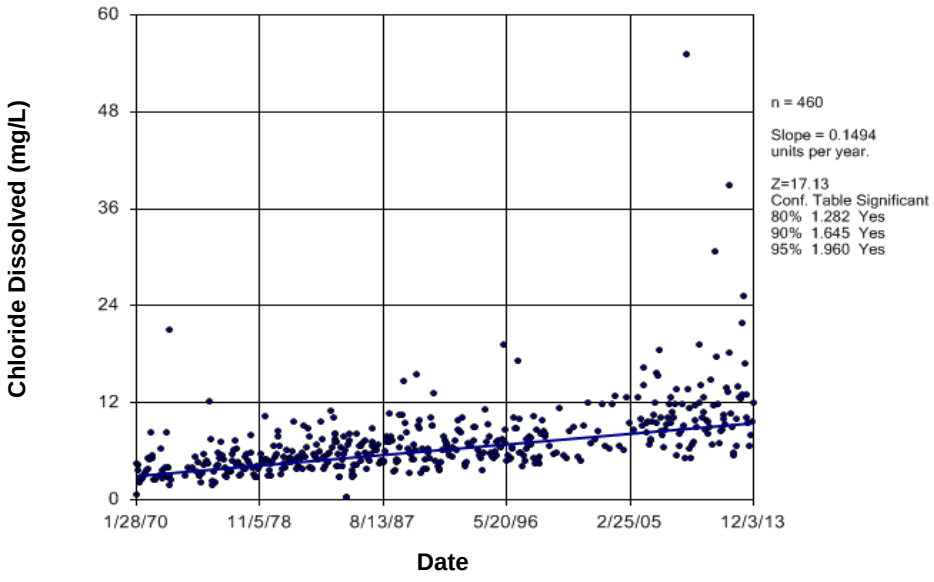


Figure C78 South Saskatchewan River: Chloride Dissolved

‘

Time Series

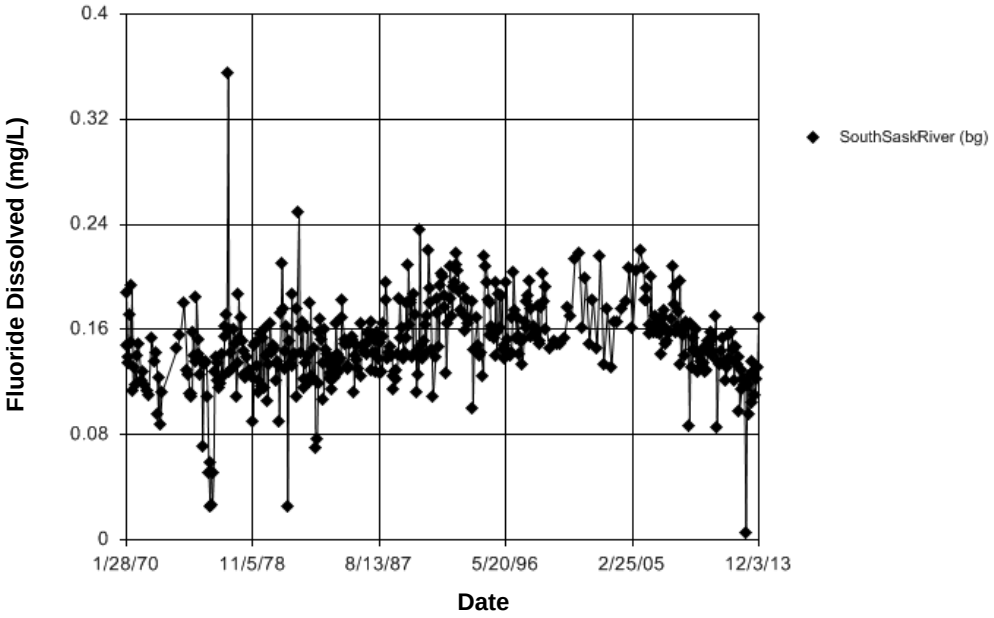


Figure C79 South Saskatchewan River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 21.84
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 74 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 21.84
Adjusted Kruskal-Wallis statistic (H') = 21.84

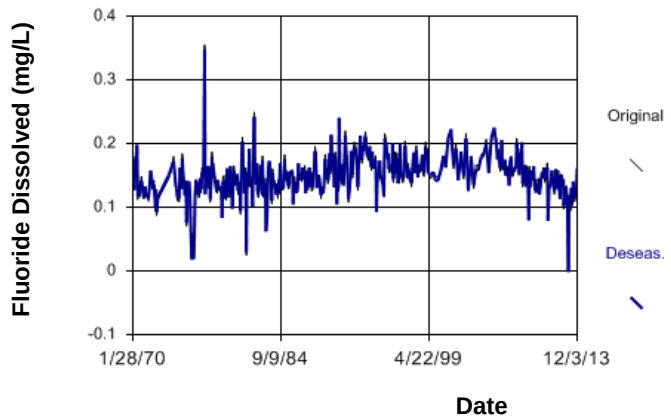


Figure C80 South Saskatchewan River: Fluoride Dissolved

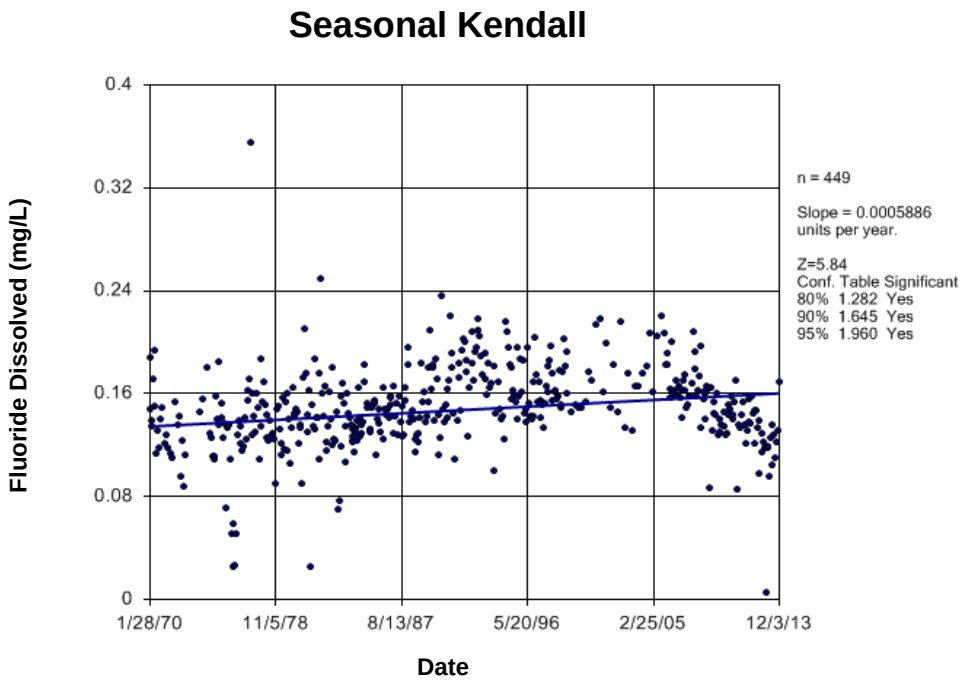


Figure C81 South Saskatchewan River: Fluoride Dissolved

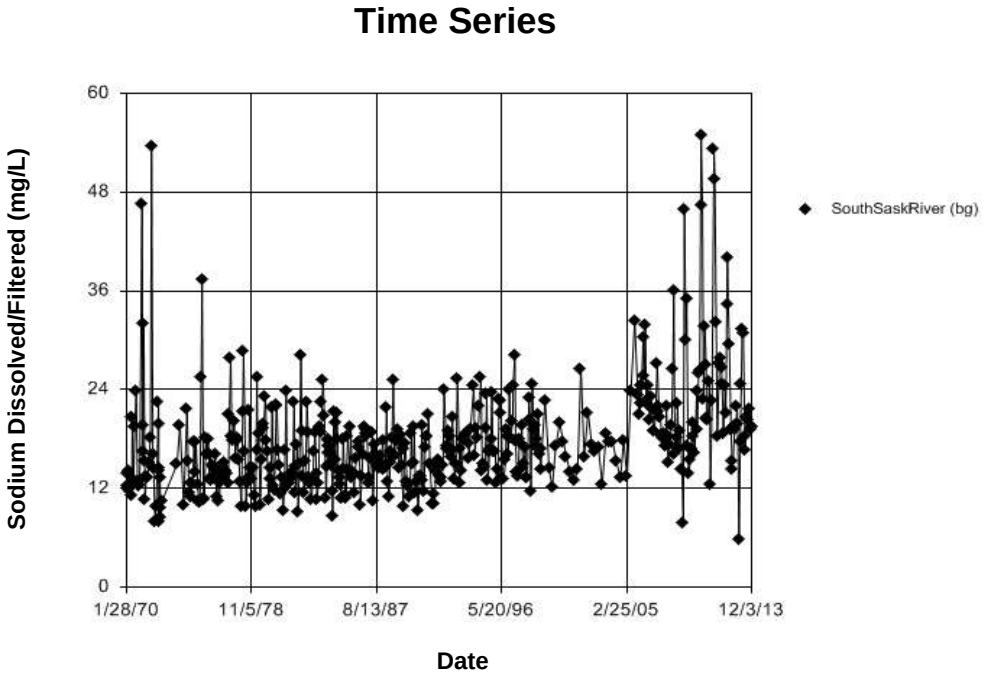


Figure C82 South Saskatchewan River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 11.85
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 44 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 11.85
Adjusted Kruskal-Wallis statistic (H') = 11.85

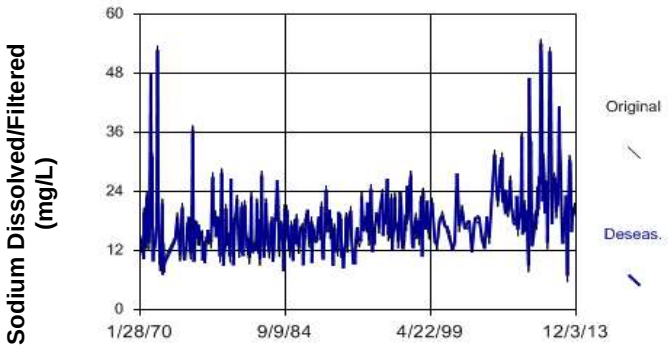


Figure C83 South Saskatchewan River: Sodium Dissolved/Filtered

Seasonal Kendall

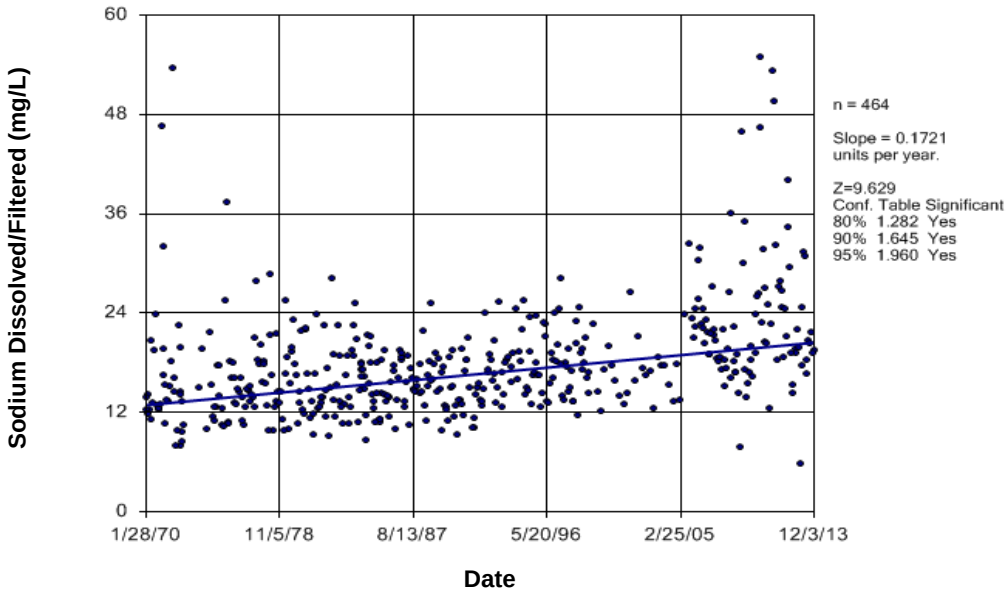


Figure C84 South Saskatchewan River: Sodium Dissolved/Filtered

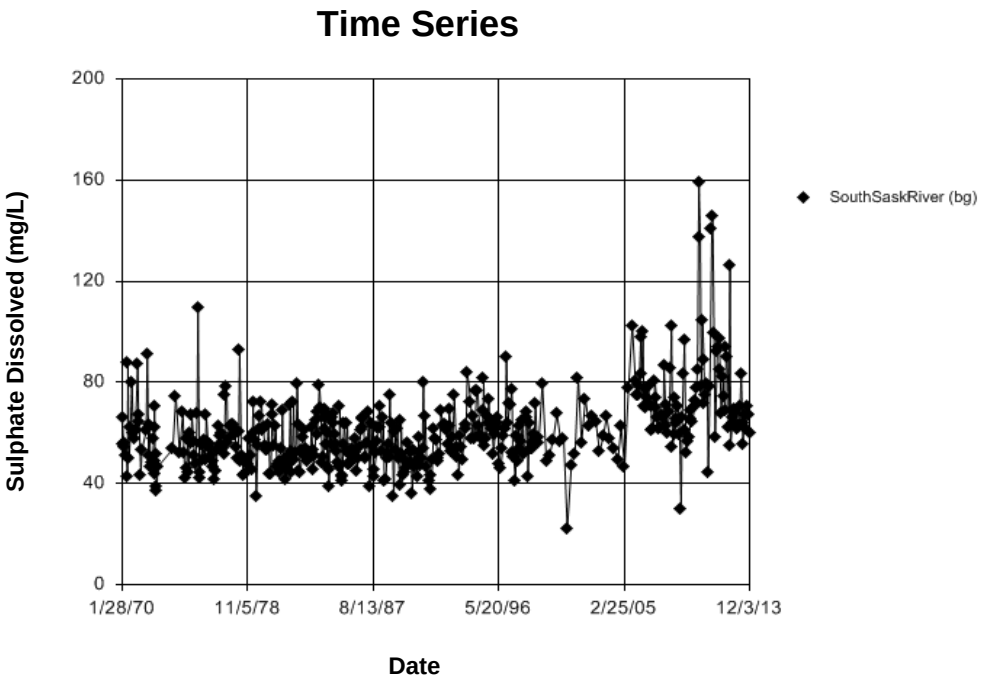


Figure C85 South Saskatchewan River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.002622
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 22 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.002622
Adjusted Kruskal-Wallis statistic (H') = 0.002622

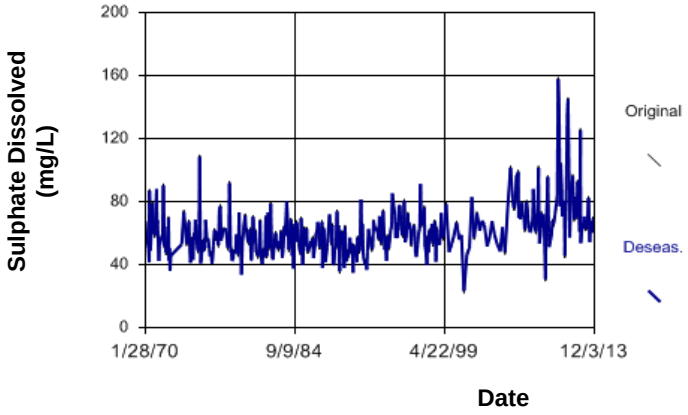


Figure C86 South Saskatchewan River: Sulphate Dissolved

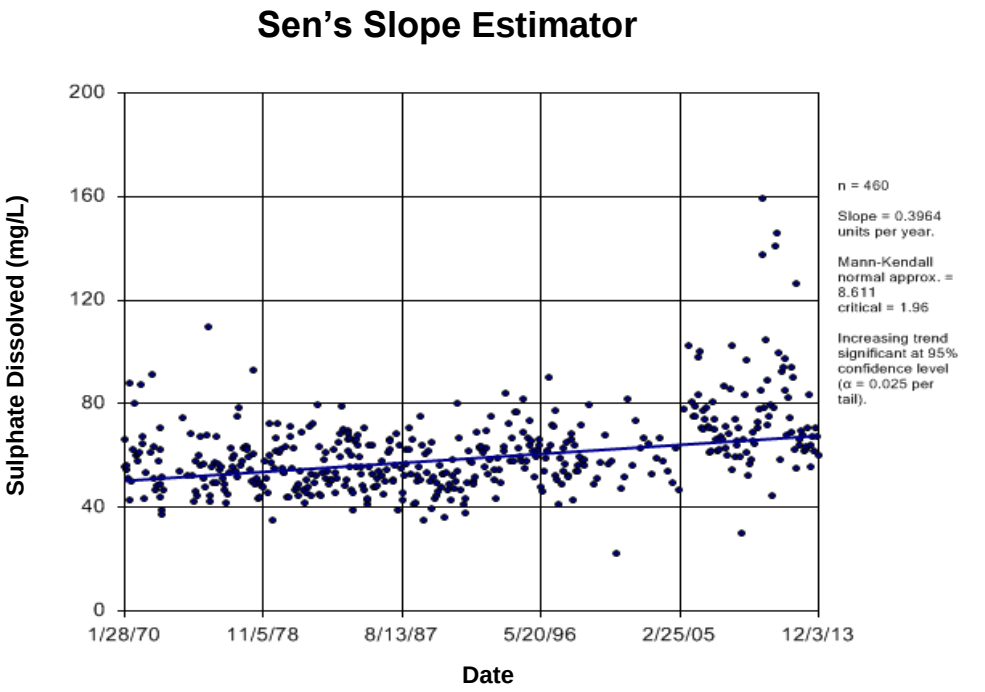


Figure C87 South Saskatchewan River: Sulphate Dissolved

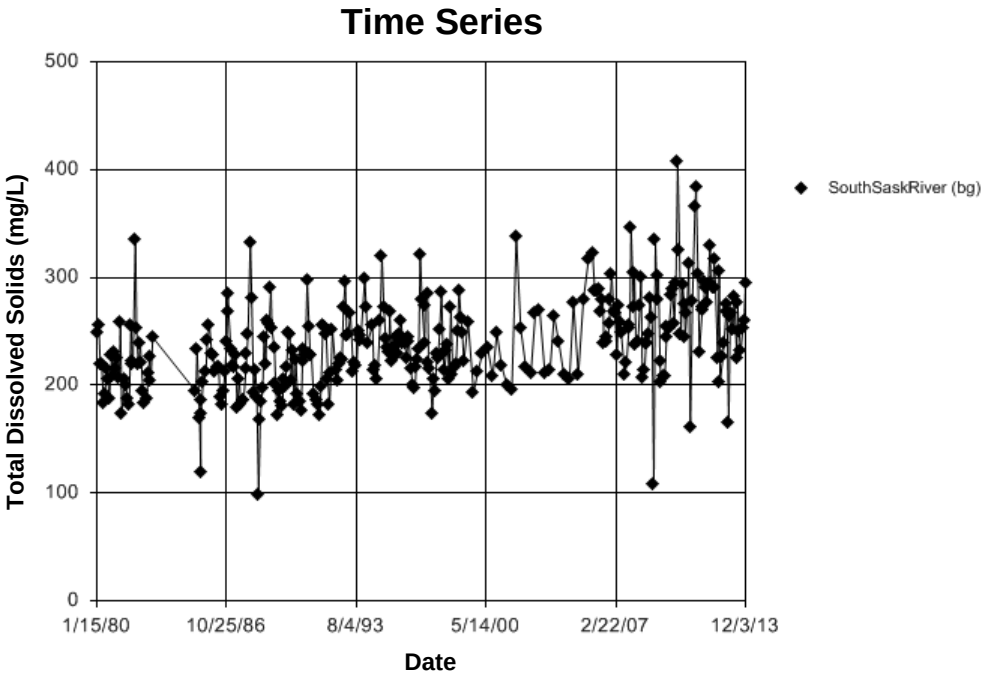


Figure C88 South Saskatchewan River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 43.35
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 30 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 43.34
Adjusted Kruskal-Wallis statistic (H') = 43.35

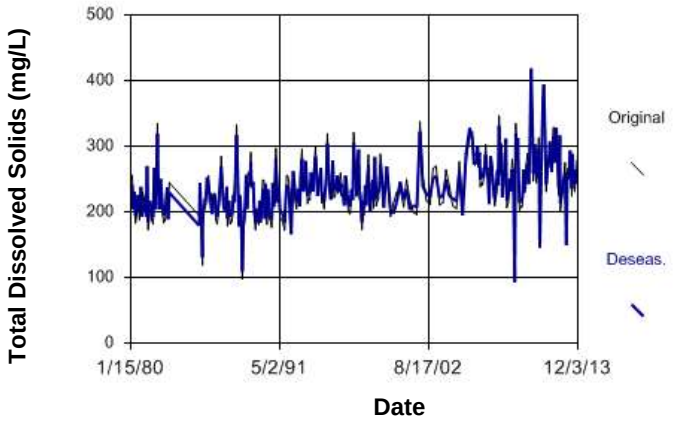


Figure C89 South Saskatchewan River: Total Dissolved Solids

Seasonal Kendall

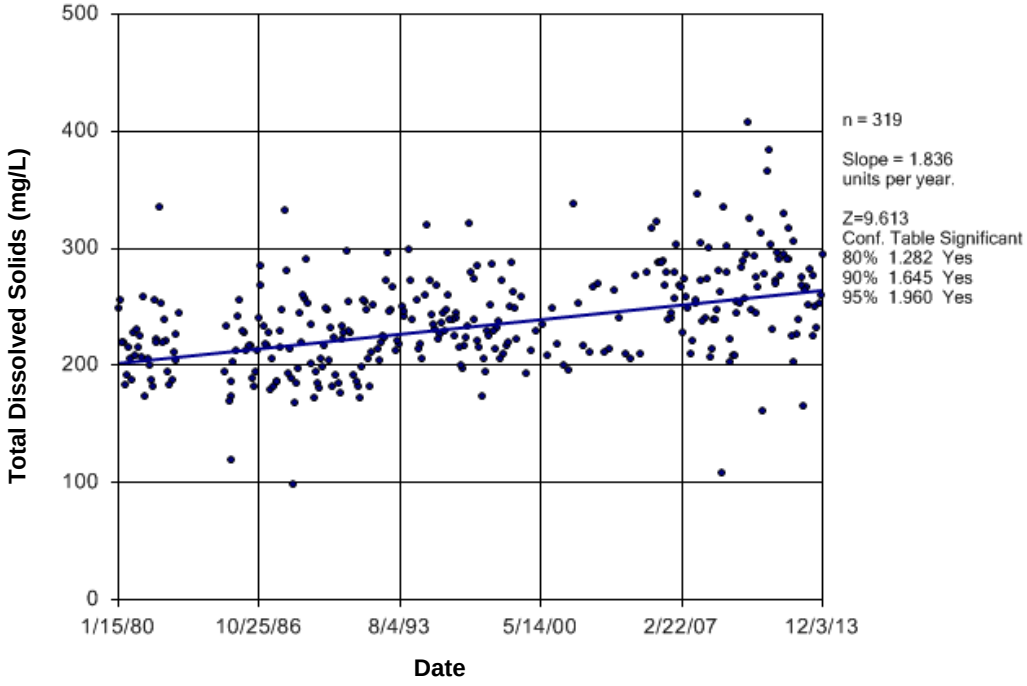


Figure C90 South Saskatchewan River: Total Dissolved Solids

Time Series

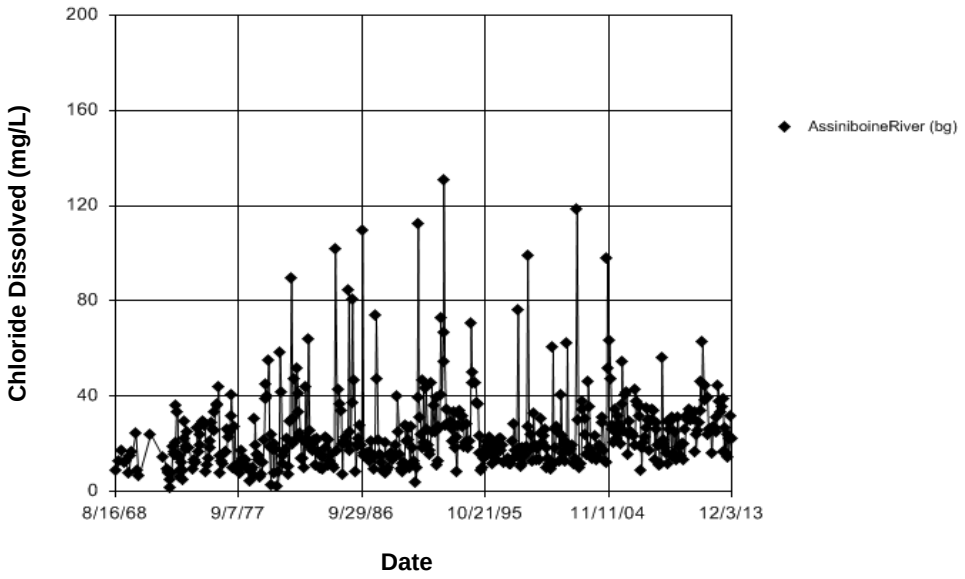


Figure C91 Assiniboine River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 50.71
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 29 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 50.71
Adjusted Kruskal-Wallis statistic (H') = 50.71

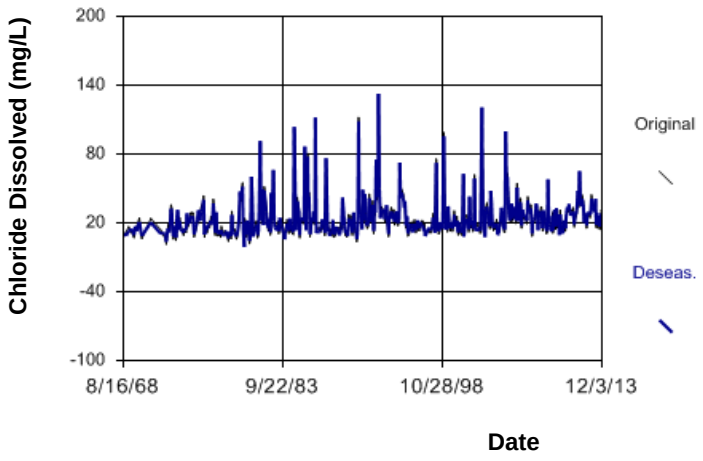


Figure C92 Assiniboine River: Chloride Dissolved

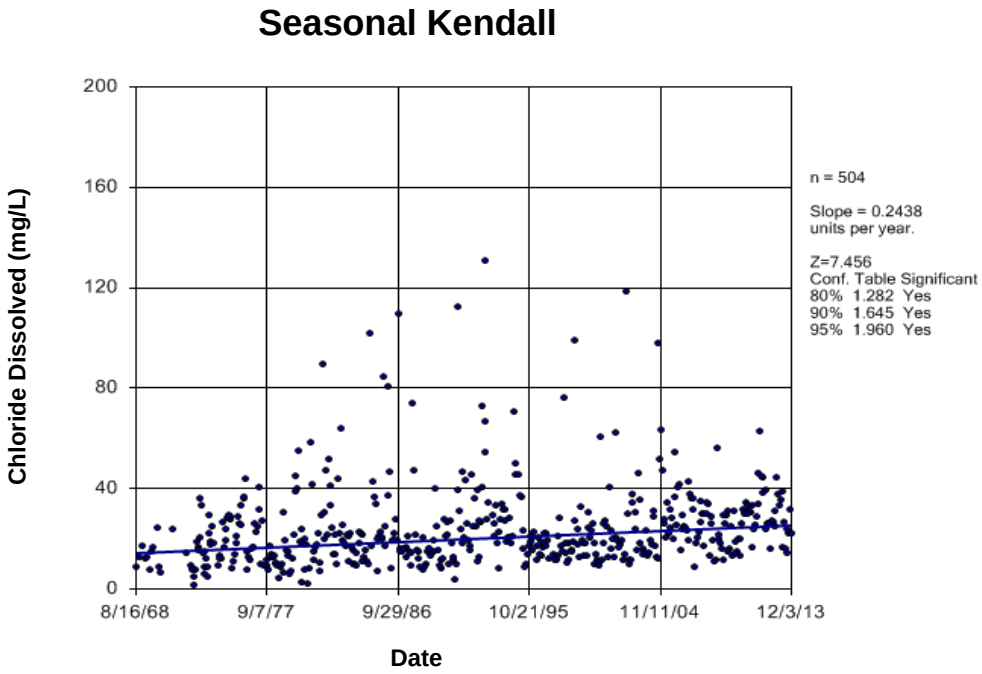


Figure C93 Assiniboine River: Chloride Dissolved

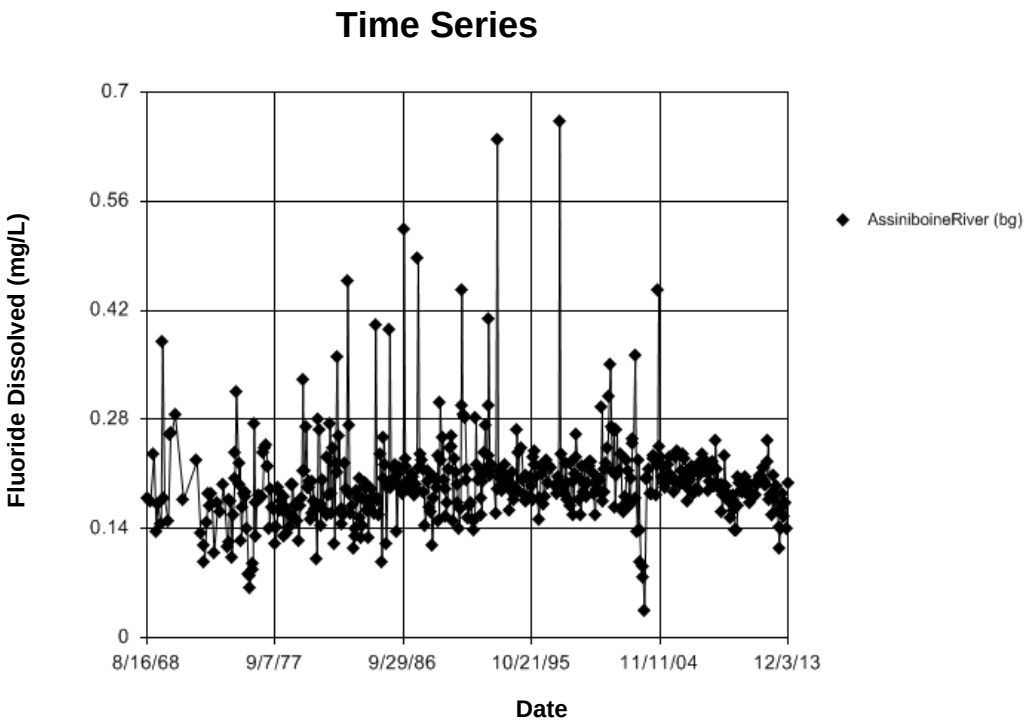


Figure C94 Assiniboine River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 23.03
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 68 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 23.03
Adjusted Kruskal-Wallis statistic (H') = 23.03

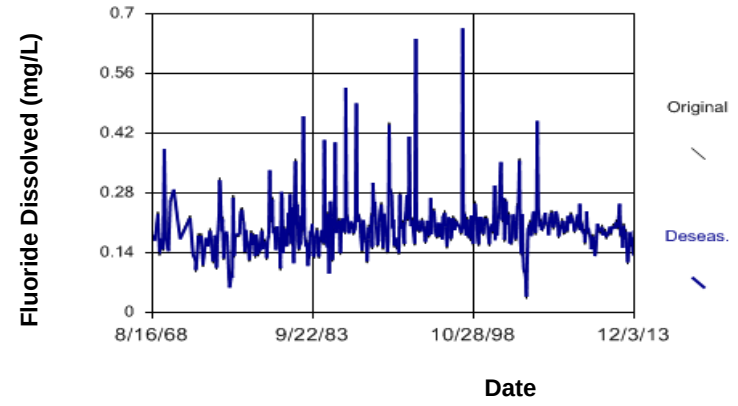


Figure C95 Assiniboine River: Fluoride Dissolved

Seasonal Kendall

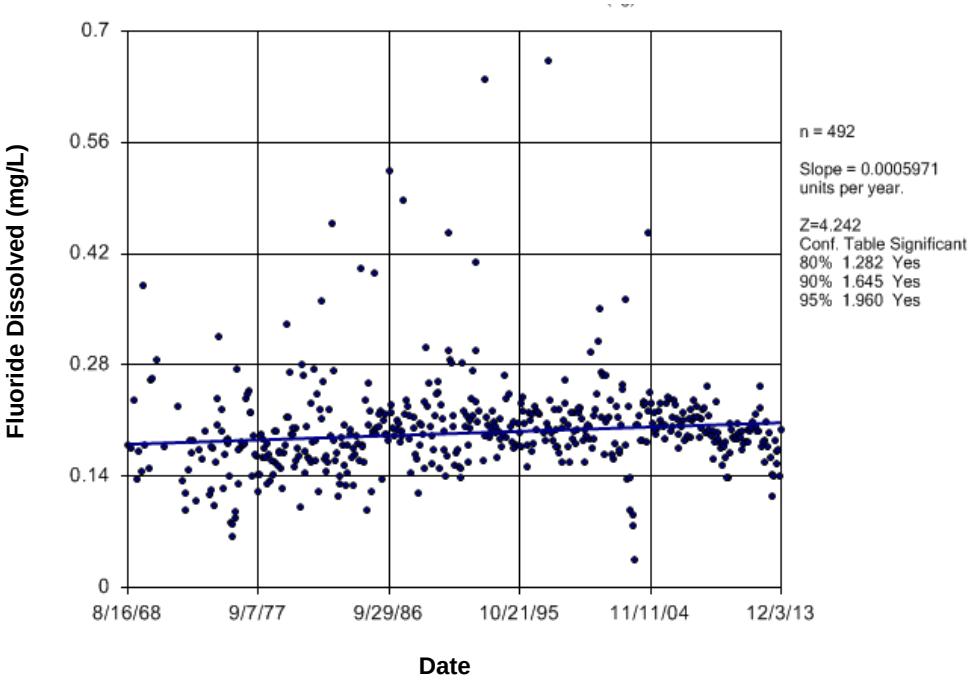


Figure C96 Assiniboine River: Fluoride Dissolved

Time Series

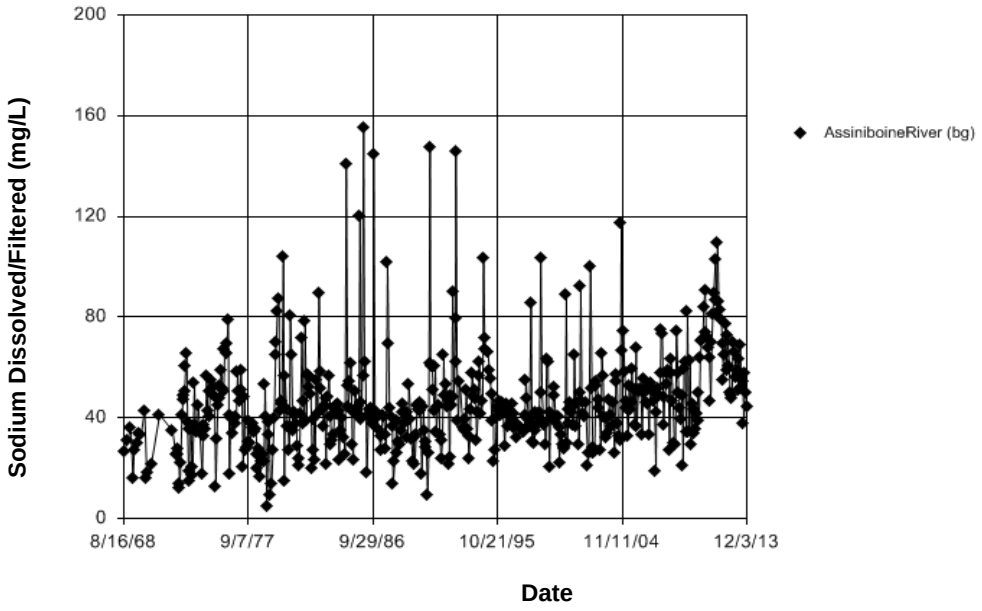


Figure C97 Assiniboine River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 39.19
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 24 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 39.19
Adjusted Kruskal-Wallis statistic (H') = 39.19

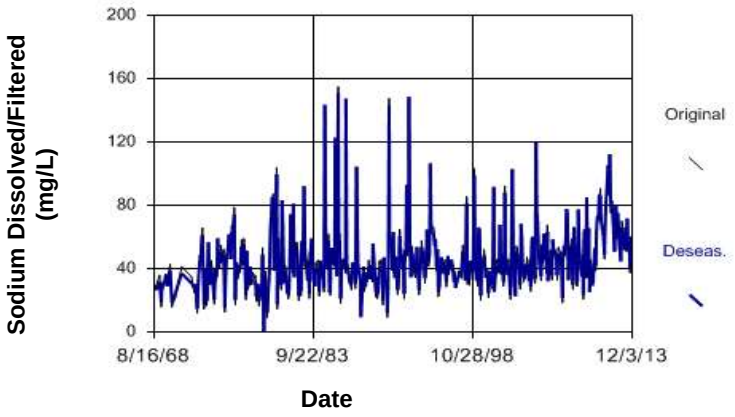


Figure C98 Assiniboine River: Sodium Dissolved/Filtered

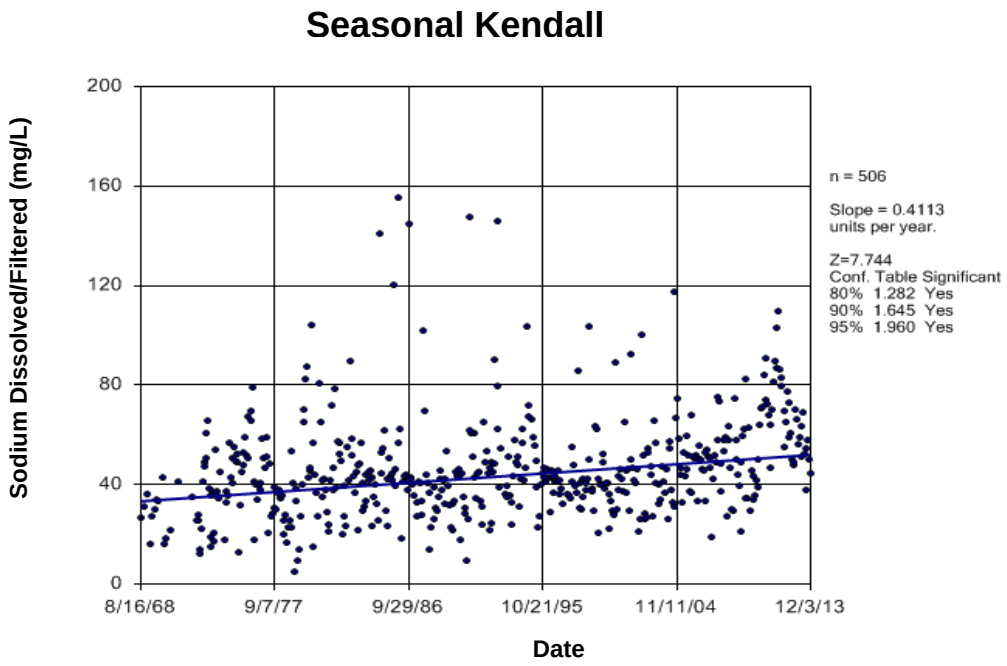


Figure C99 Assiniboine River: Sodium Dissolved/Filtered

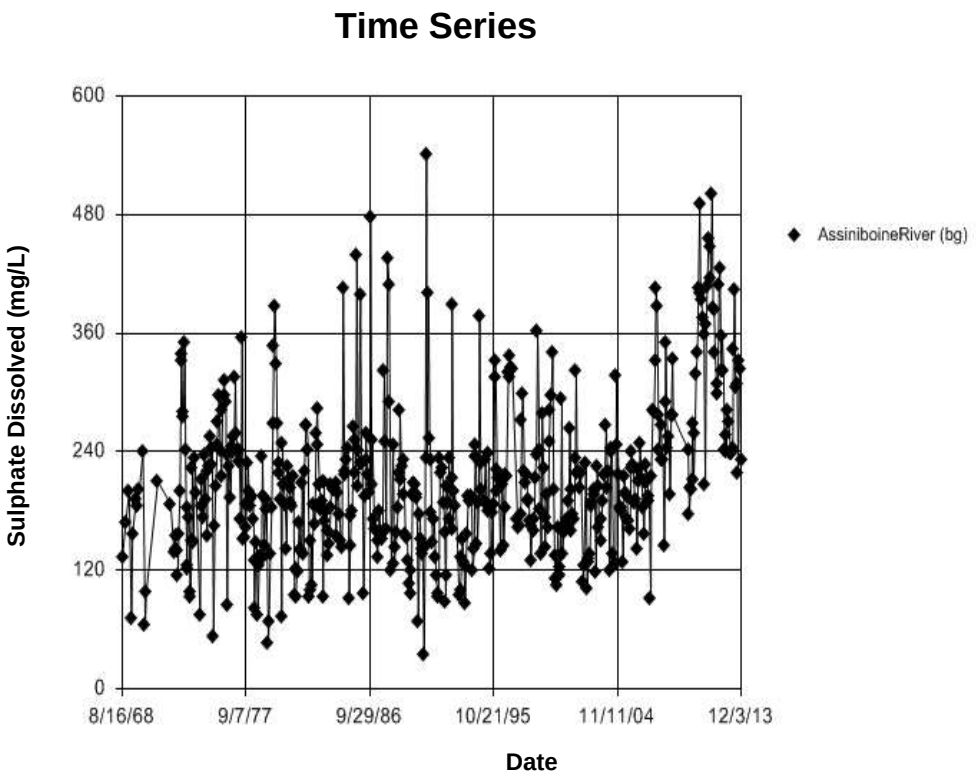


Figure C100 Assiniboine River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 64.94
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 41 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 64.94
Adjusted Kruskal-Wallis statistic (H') = 64.94

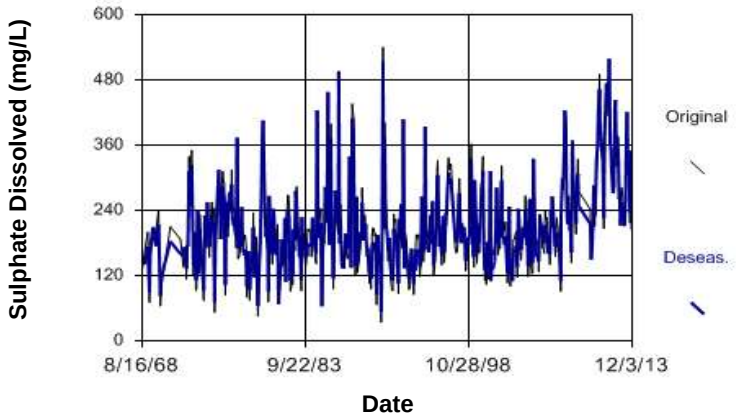


Figure C101 Assiniboine River: Sulphate Dissolved

Seasonal Kendall

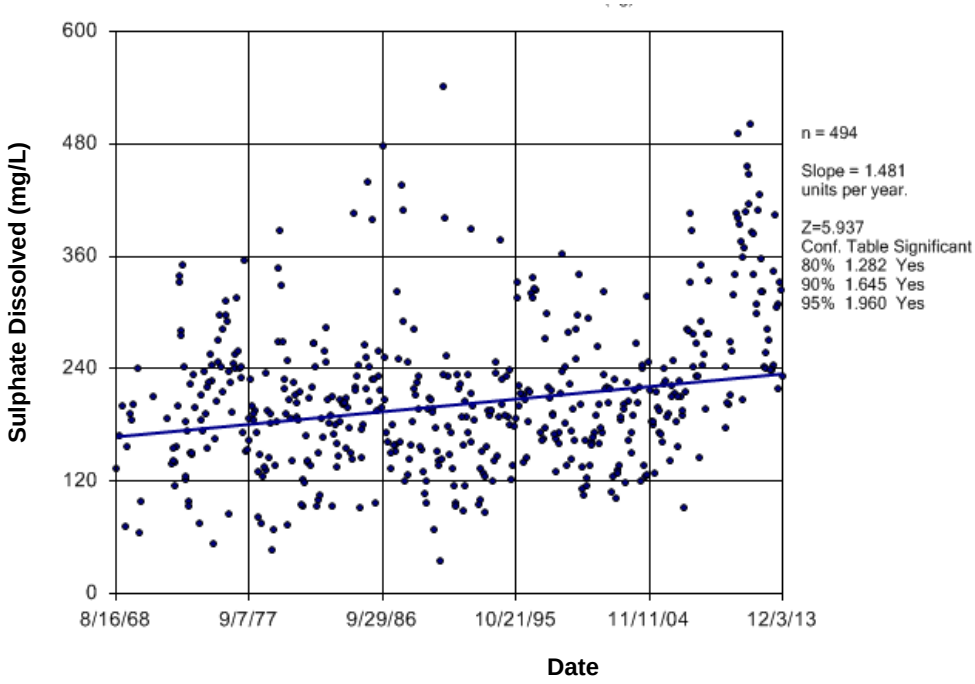


Figure C102 Assiniboine River: Sulphate Dissolved

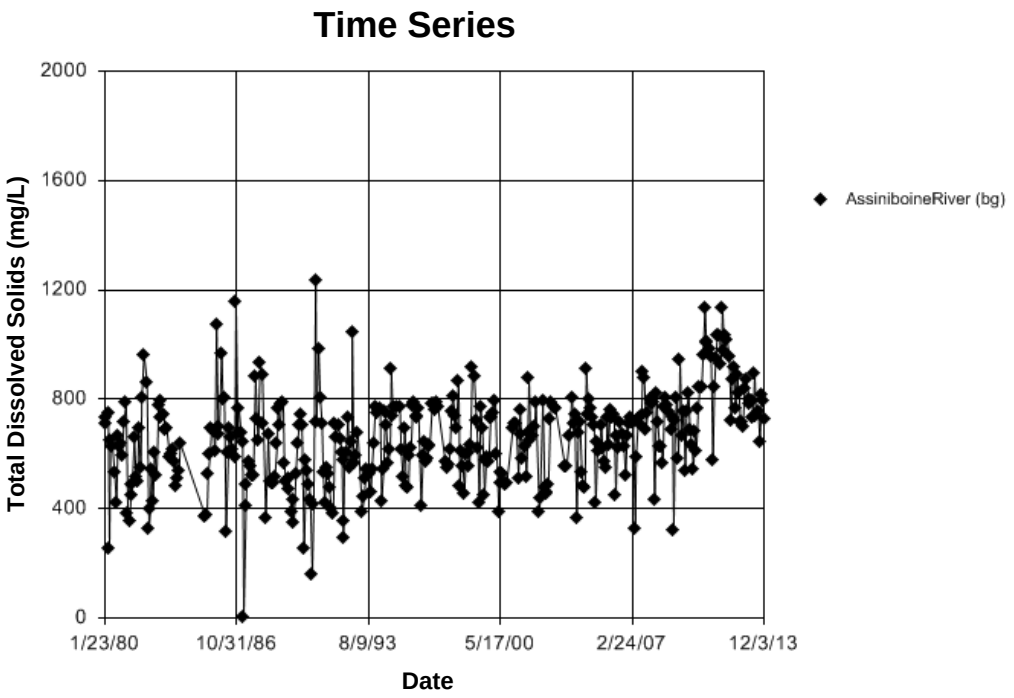


Figure C103 Assiniboine River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 90.87
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 19 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 90.87
Adjusted Kruskal-Wallis statistic (H') = 90.87

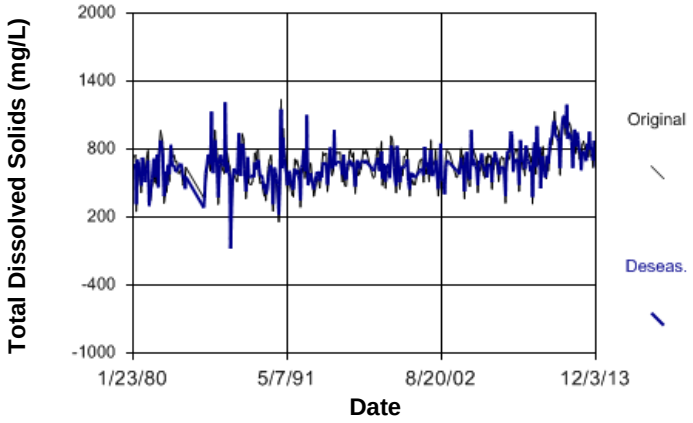


Figure C104 Assiniboine River: Total Dissolved Solids

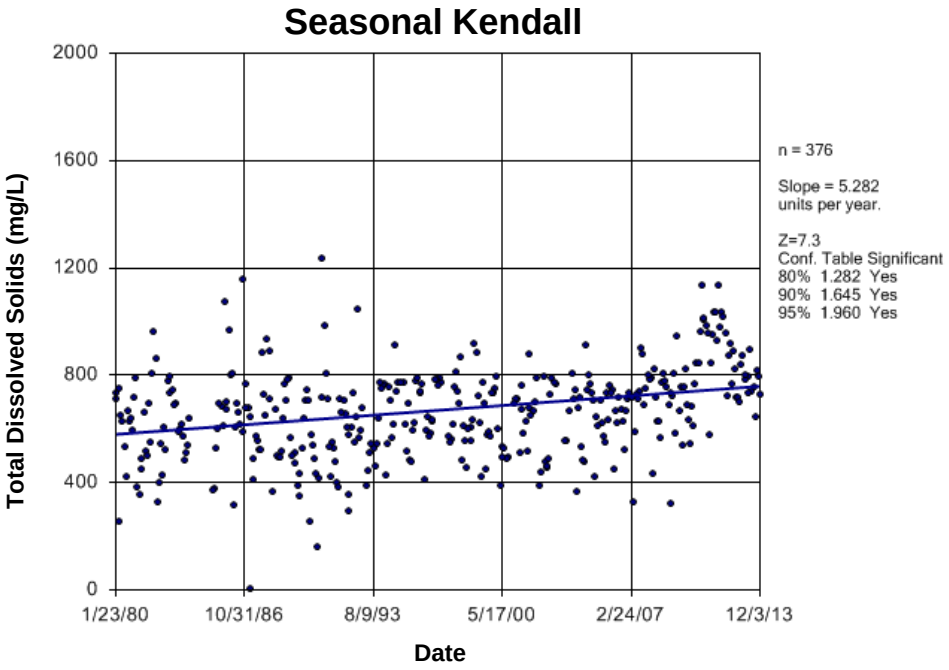


Figure C105 Assiniboine River: Total Dissolved Solids

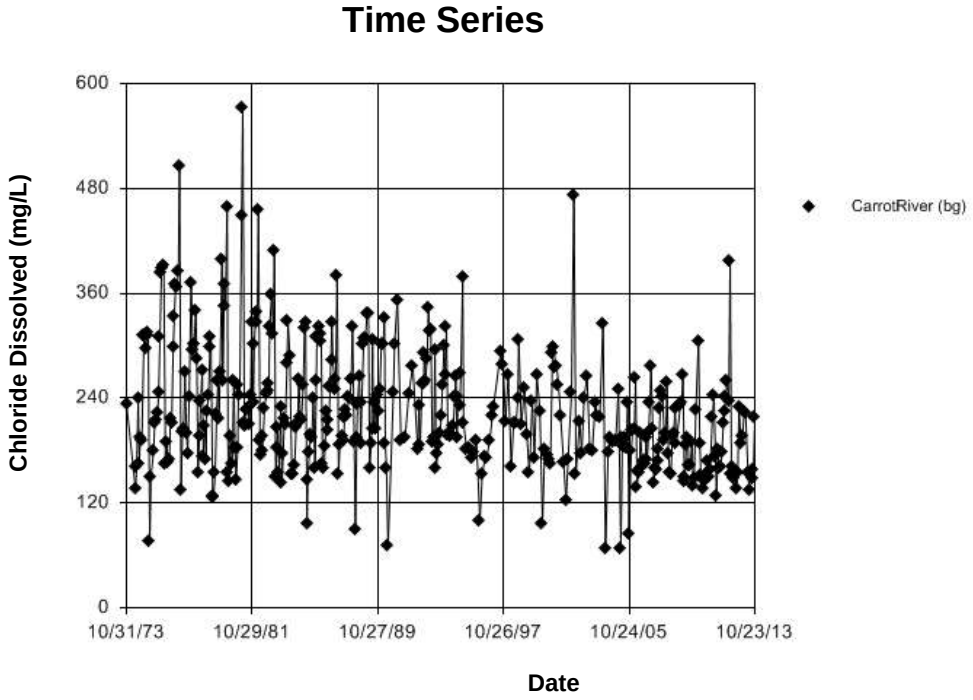


Figure C106 Carrot River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 145.4
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 29 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 145.4
Adjusted Kruskal-Wallis statistic (H') = 145.4

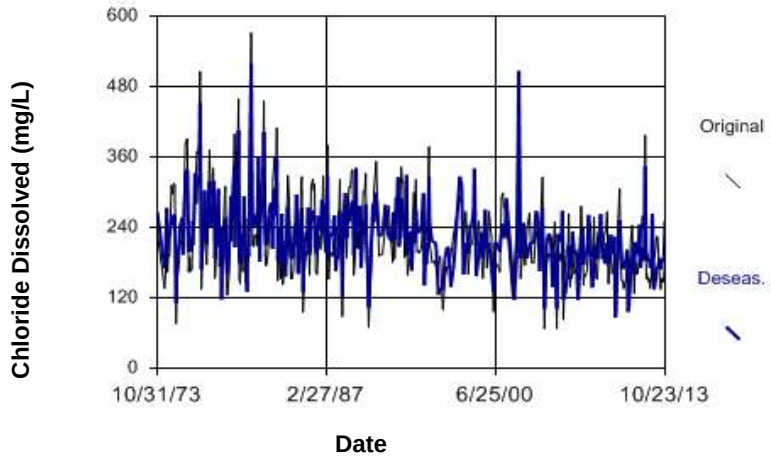


Figure C107 Carrot River: Chloride Dissolved

Seasonal Kendall

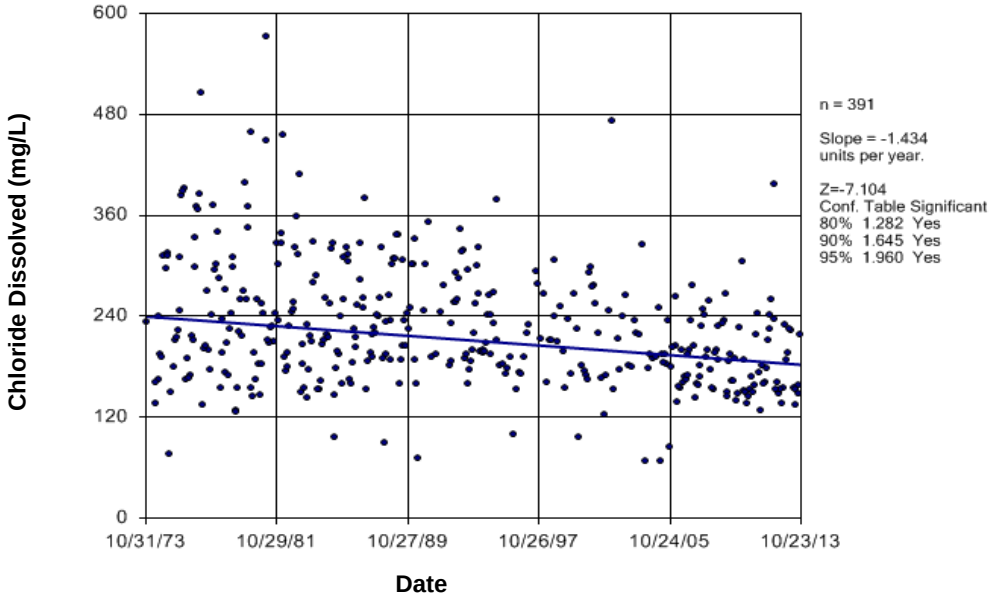


Figure C108 Carrot River: Chloride Dissolved

Time Series

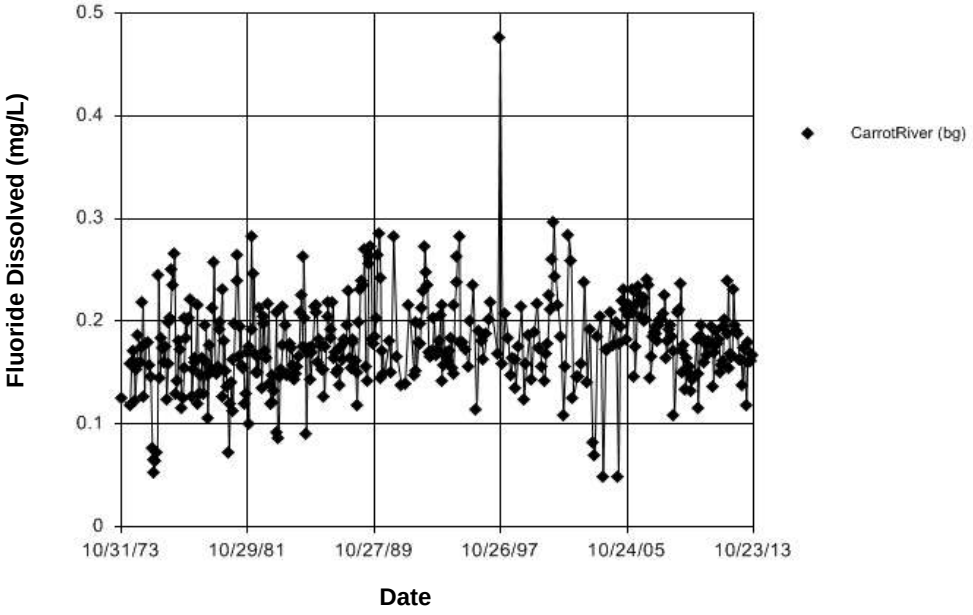


Figure C109 Carrot River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 71.29
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 47 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 71.29
Adjusted Kruskal-Wallis statistic (H') = 71.29

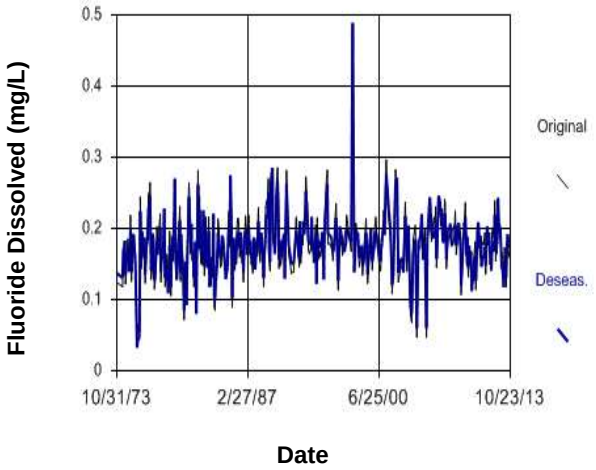


Figure C110 Carrot River: Fluoride Dissolved

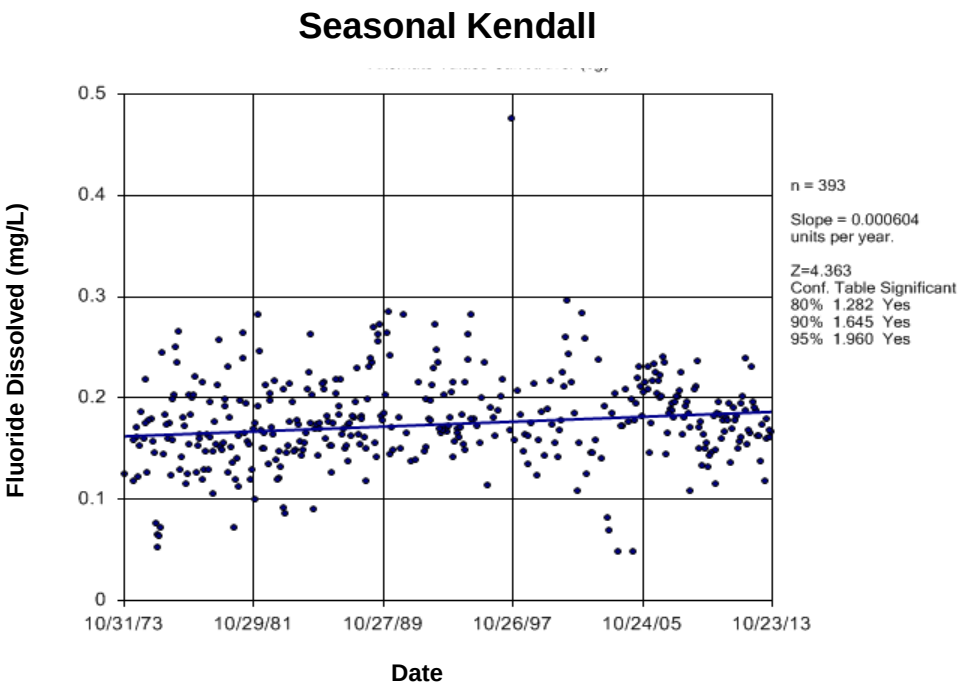


Figure C111 Carrot River: Fluoride Dissolved

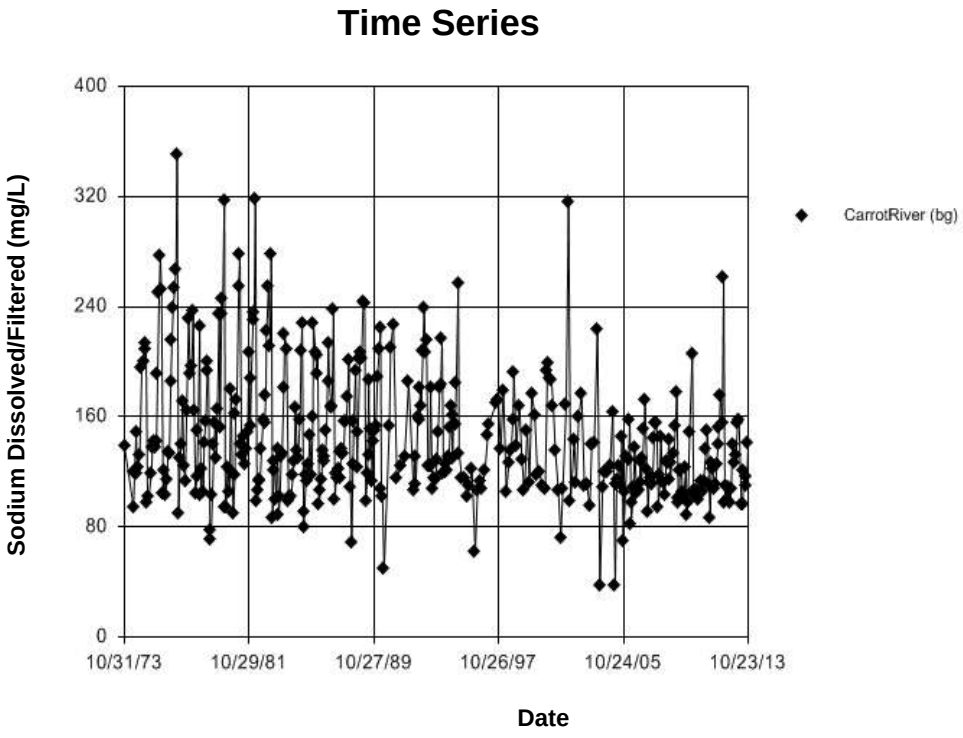


Figure C112 Carrot River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 152.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 42 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 152.7
Adjusted Kruskal-Wallis statistic (H') = 152.7

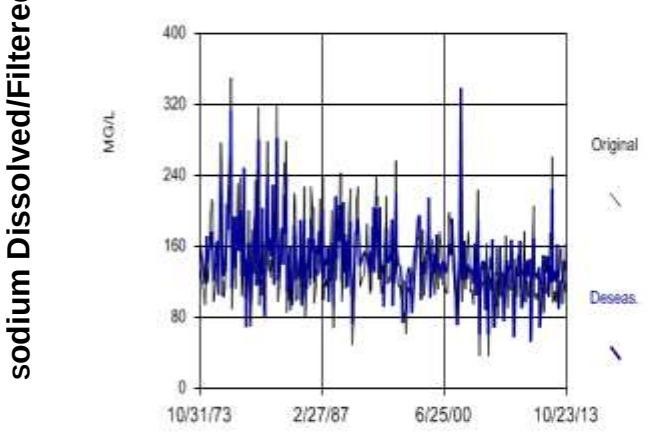


Figure C113 Carrot River: Sodium Dissolved/Filtered

Seasonal Kendall

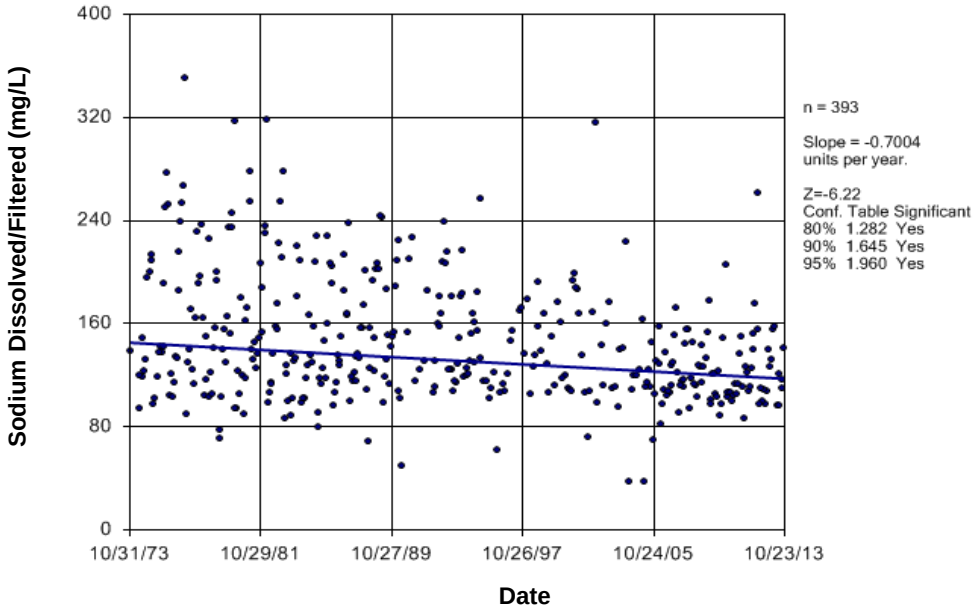


Figure C114 Carrot River: Sodium Dissolved/Filtered

Time Series

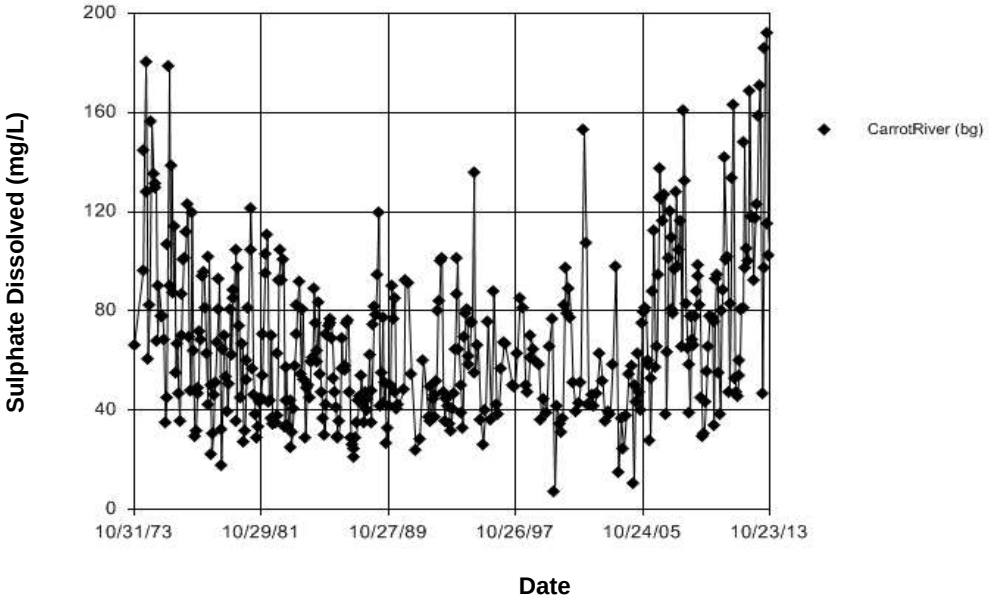


Figure C114 Carrot River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 76.68
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 76.68
Adjusted Kruskal-Wallis statistic (H') = 76.68

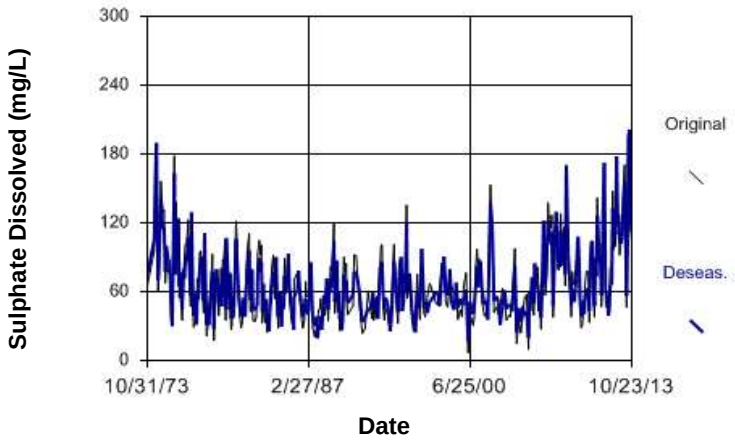


Figure C116 Carrot River: Sulphate Dissolved

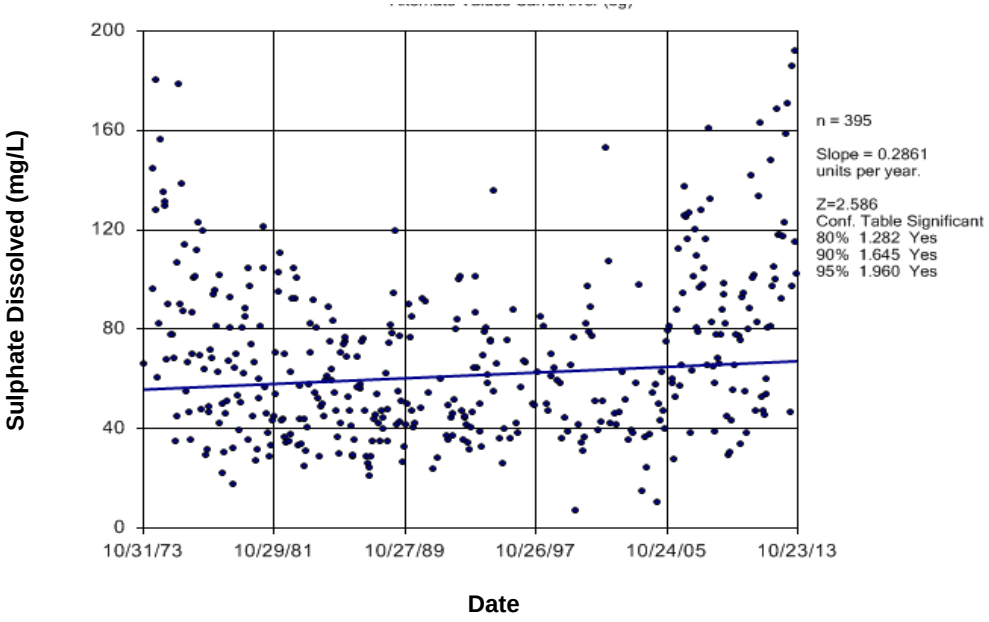


Figure C117 Carrot River: Sulphate Dissolved

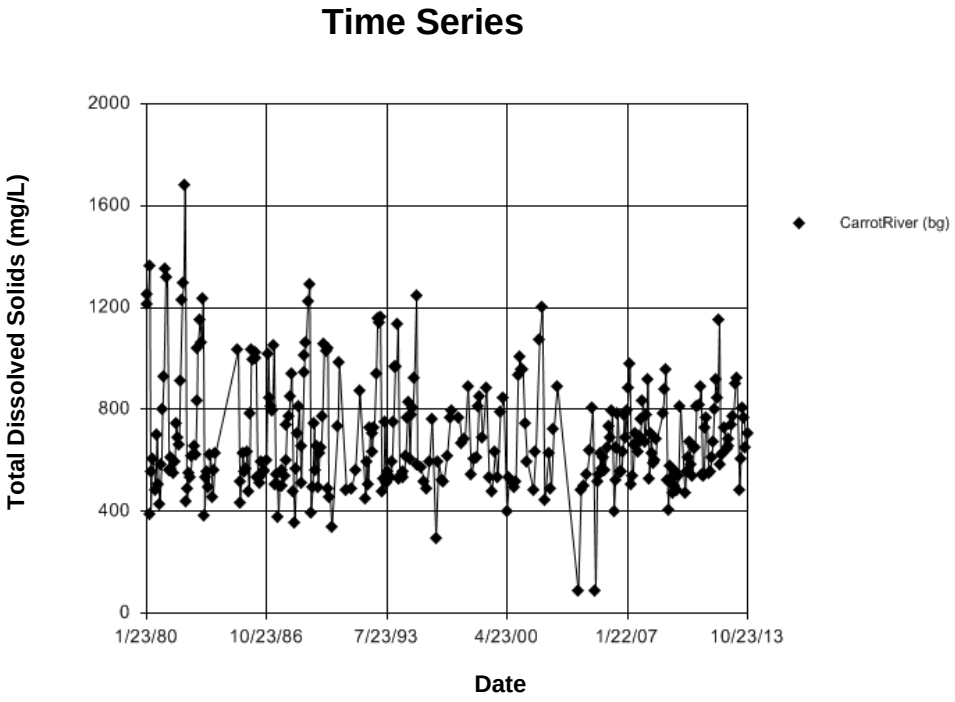


Figure C118 Carrot River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 158.9
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 158.9
Adjusted Kruskal-Wallis statistic (H') = 158.9

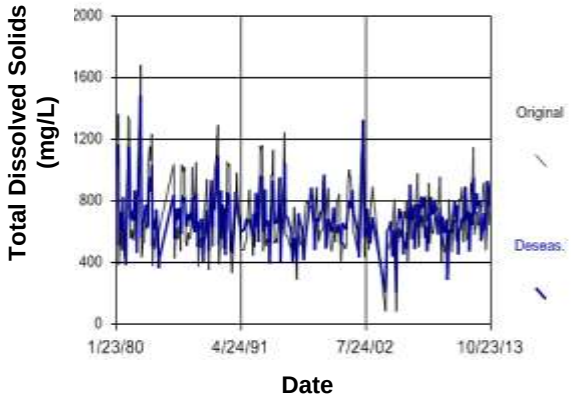


Figure C119 Carrot River: Total Dissolved Solids

Seasonal Kendall

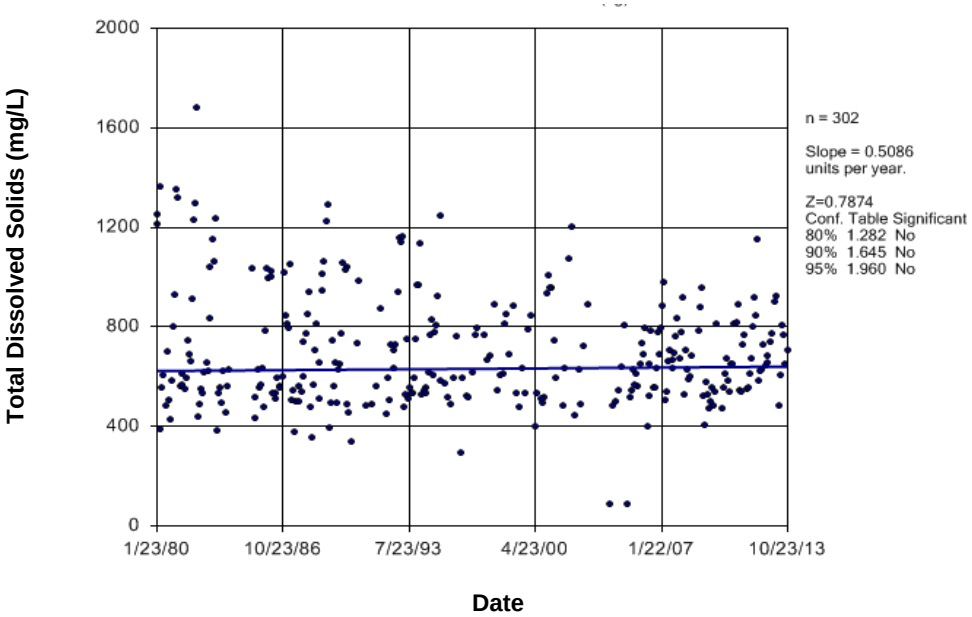


Figure C120 Carrot River: Total Dissolved Solids

Time Series

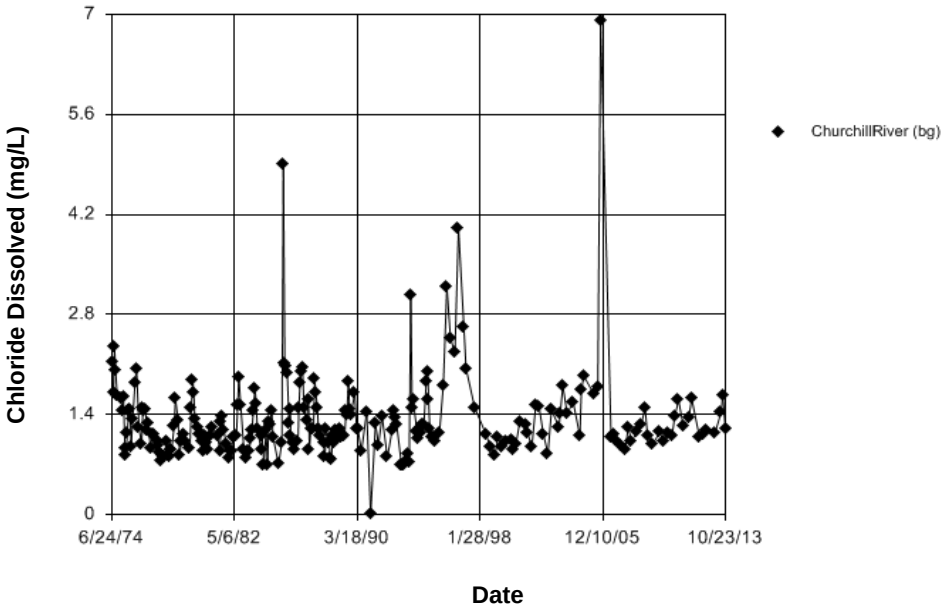


Figure C121 Churchill River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 18.12
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 16 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 18.12
Adjusted Kruskal-Wallis statistic (H') = 18.12

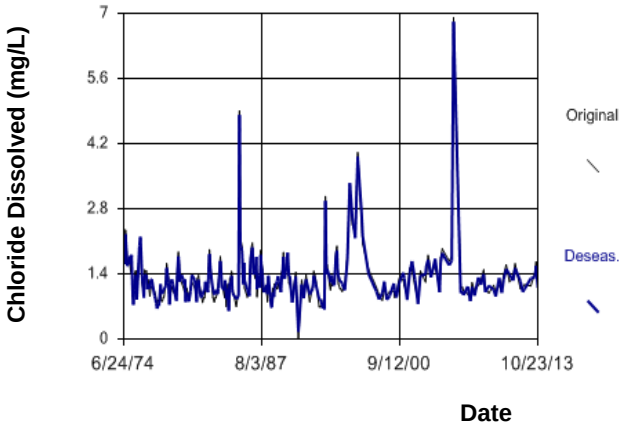


Figure C122 Churchill River: Chloride Dissolved

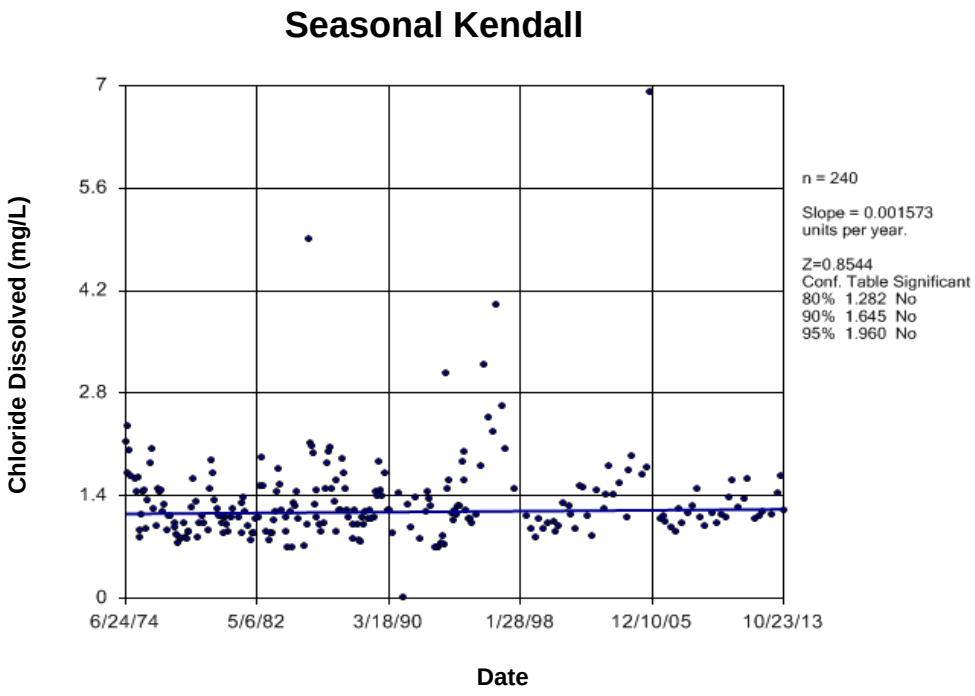


Figure C123 Churchill River: Chloride Dissolved

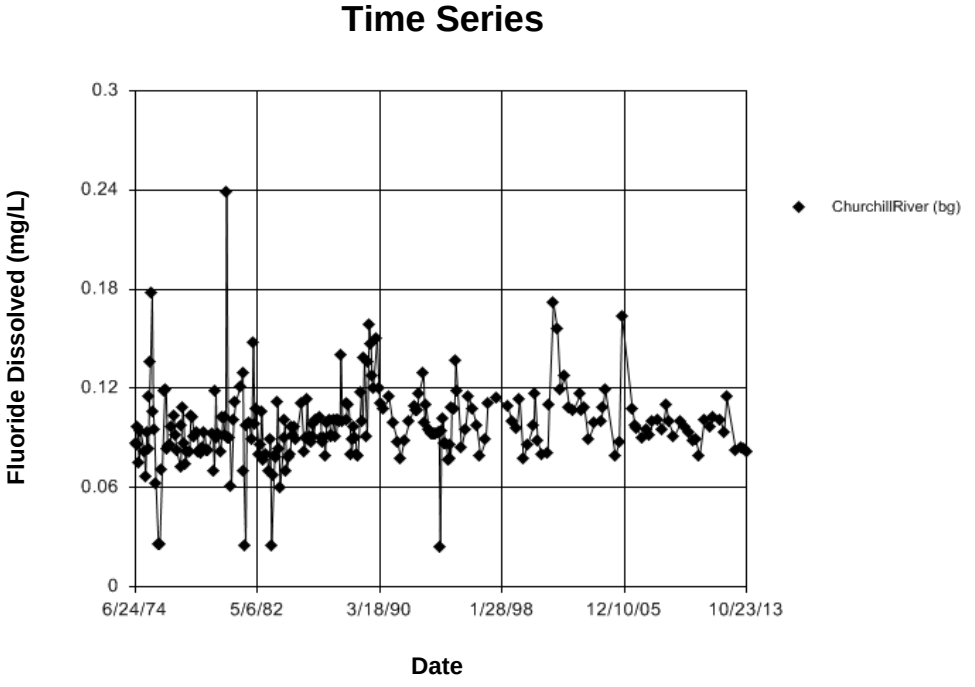


Figure C124 Churchill River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 5.423
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 5.423
Adjusted Kruskal-Wallis statistic (H') = 5.423

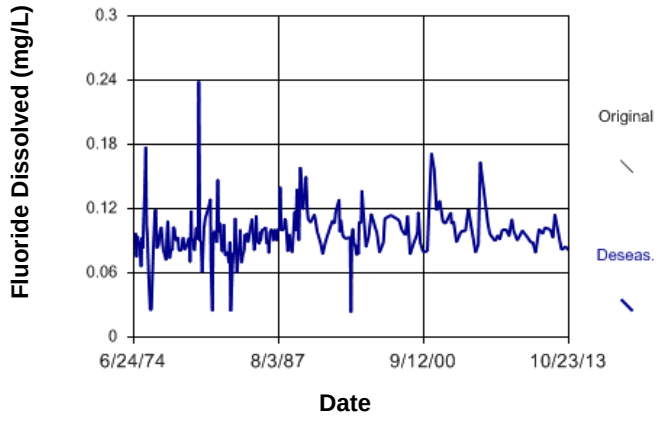


Figure C125 Churchill River: Fluoride Dissolved

Seasonal Kendall

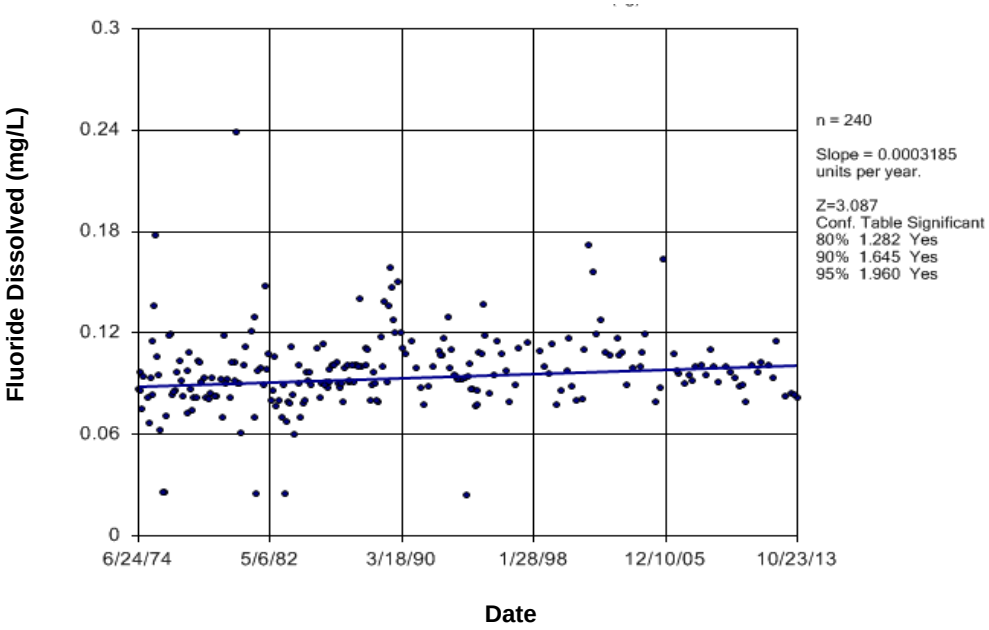


Figure C126 Churchill River: Fluoride Dissolved

Time Series

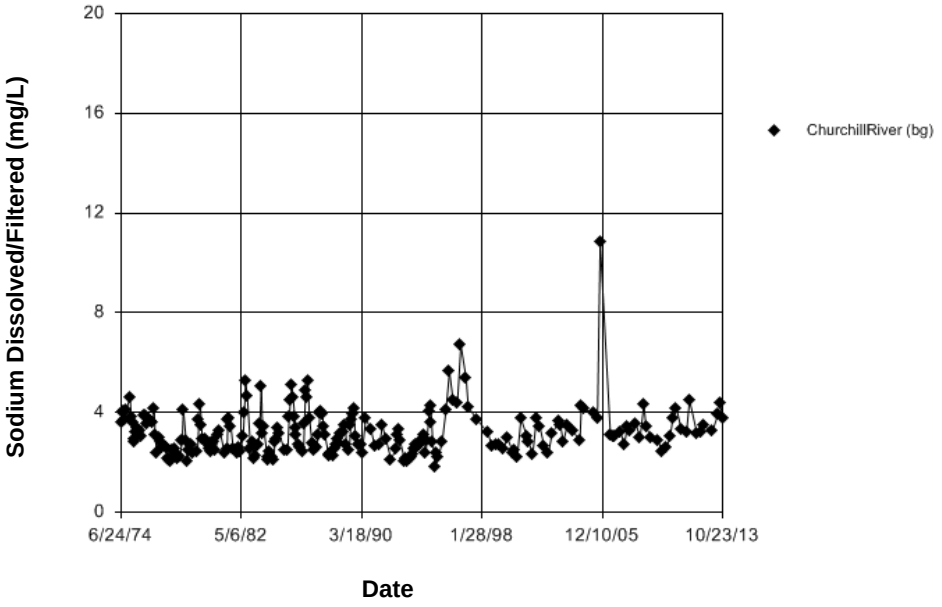


Figure C127 Churchill River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 24.82
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 24.82
Adjusted Kruskal-Wallis statistic (H') = 24.82

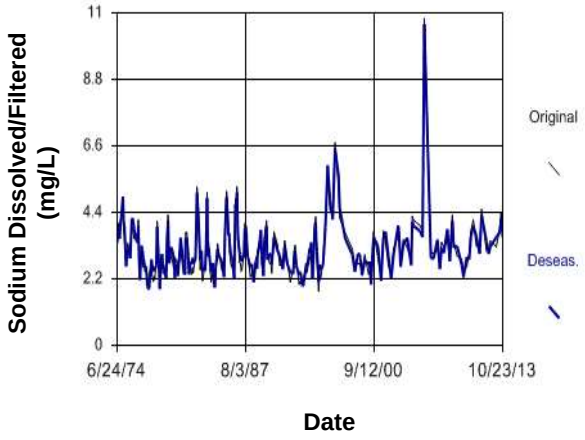


Figure C128 Churchill River: Sodium Dissolved/Filtered

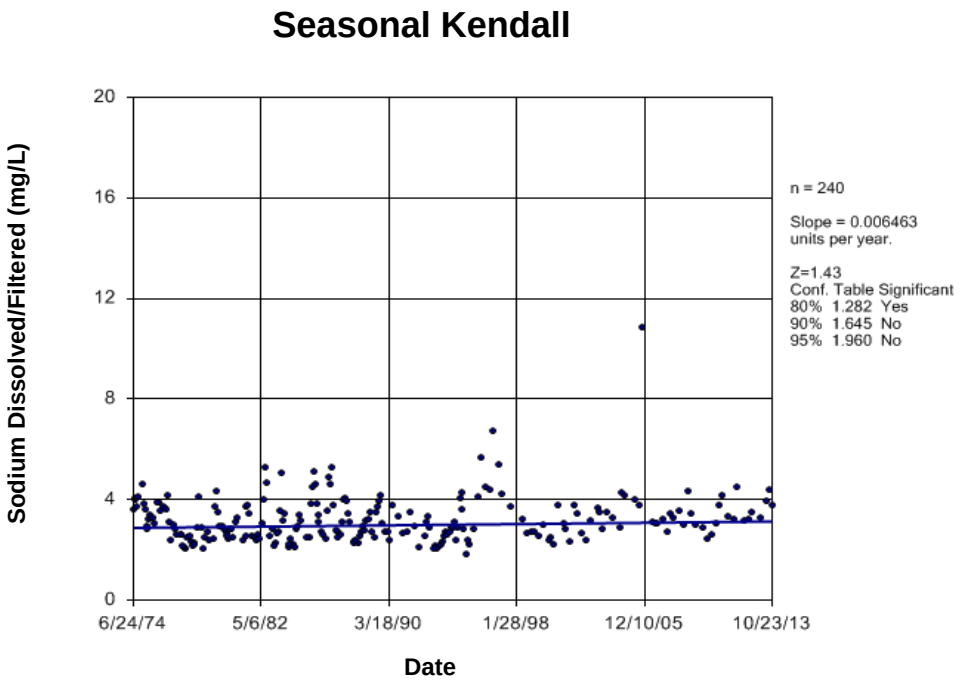


Figure C129 Churchill River: Sodium Dissolved/Filtered

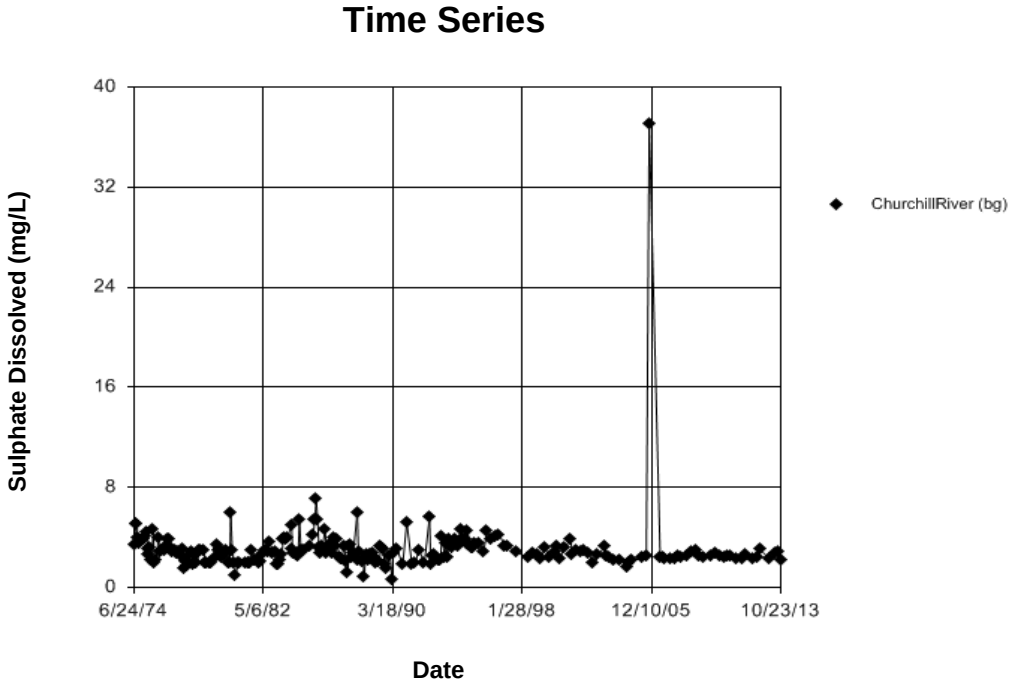


Figure C130 Churchill River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.3132
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 49 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.3131
Adjusted Kruskal-Wallis statistic (H') = 0.3132

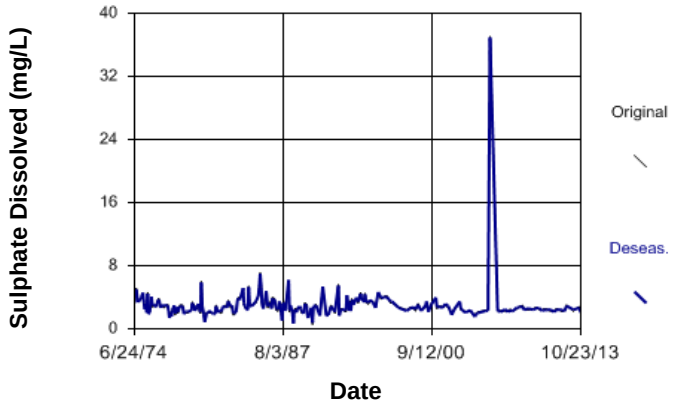


Figure C131 Churchill River: Sulphate Dissolved

Sen's Slope Estimator

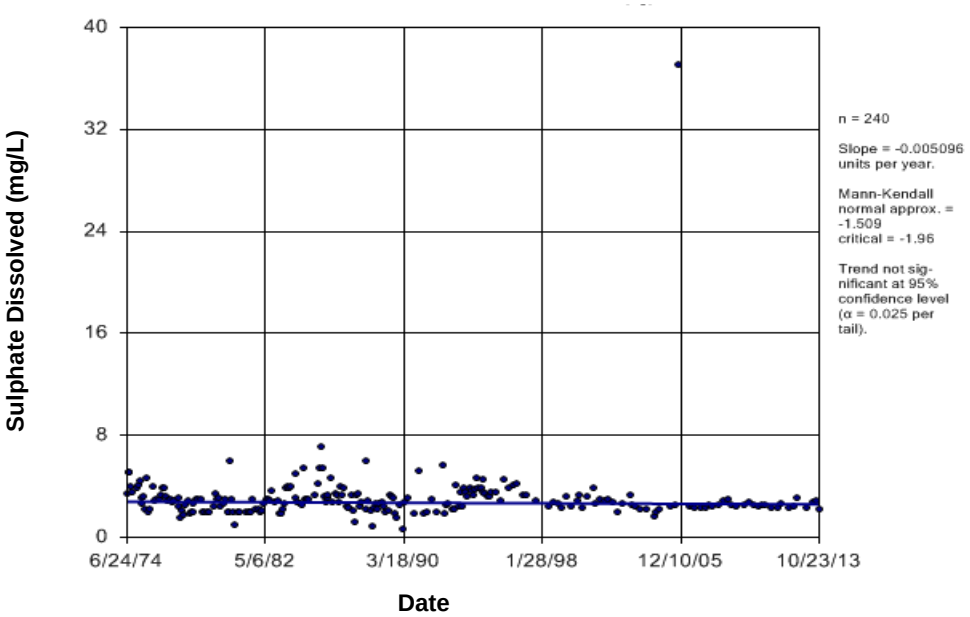


Figure C132 Churchill River: Sulphate Dissolved

Time Series

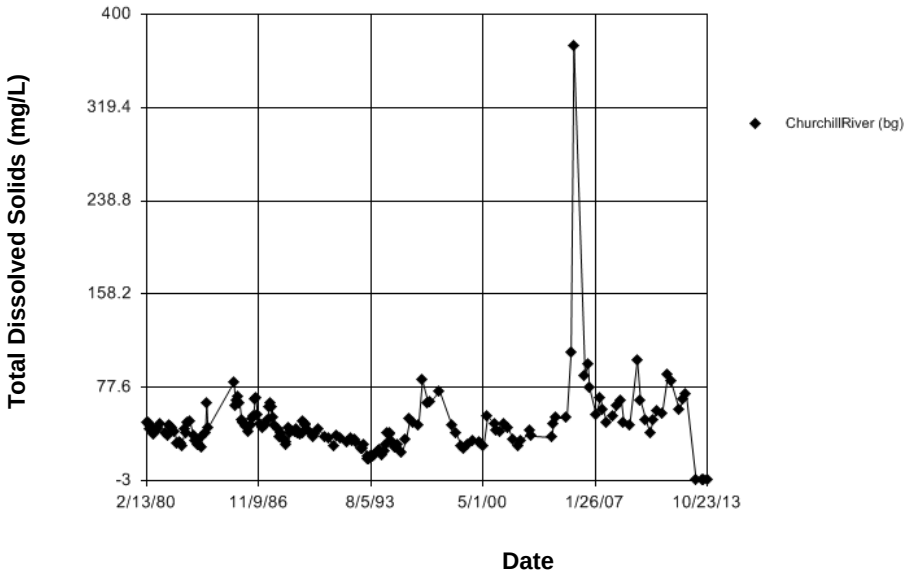


Figure C133 Churchill River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 8.625
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.625
Adjusted Kruskal-Wallis statistic (H') = 8.625

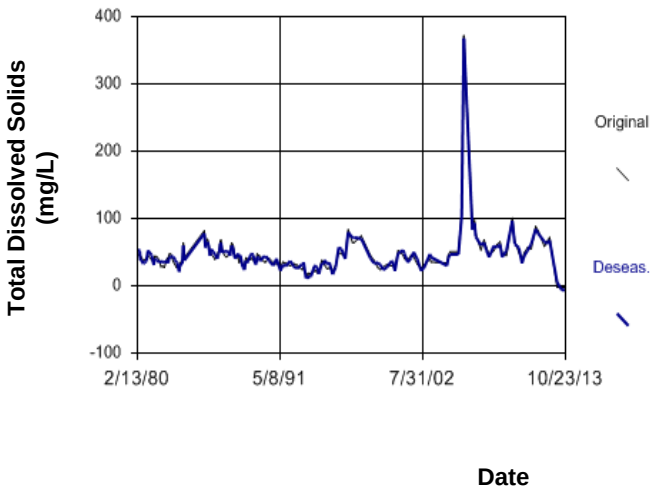


Figure C134 Churchill River: Total Dissolved Solids

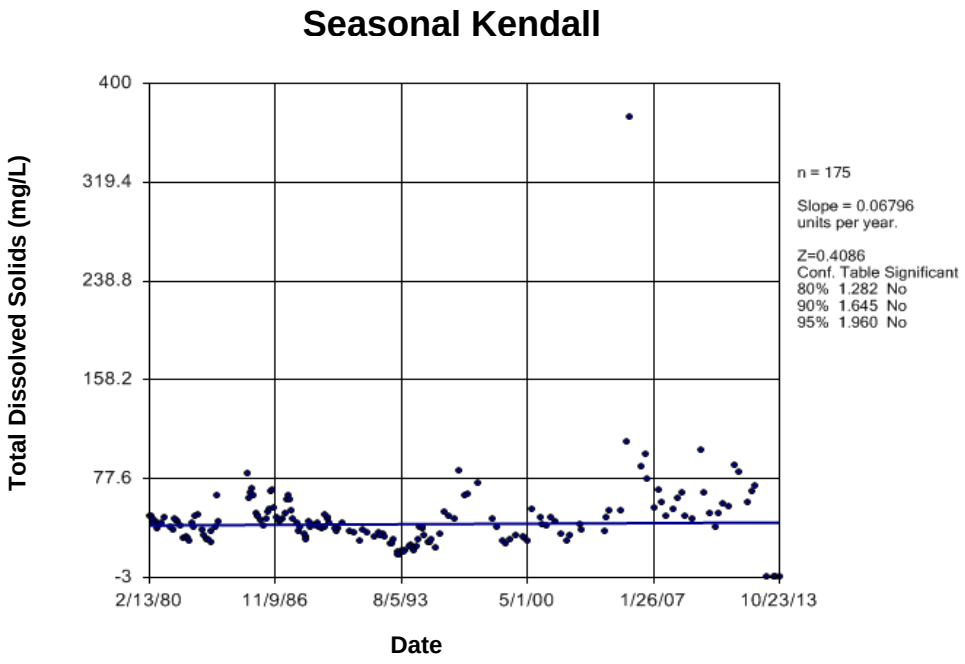


Figure C135 Churchill River: Total Dissolved Solids

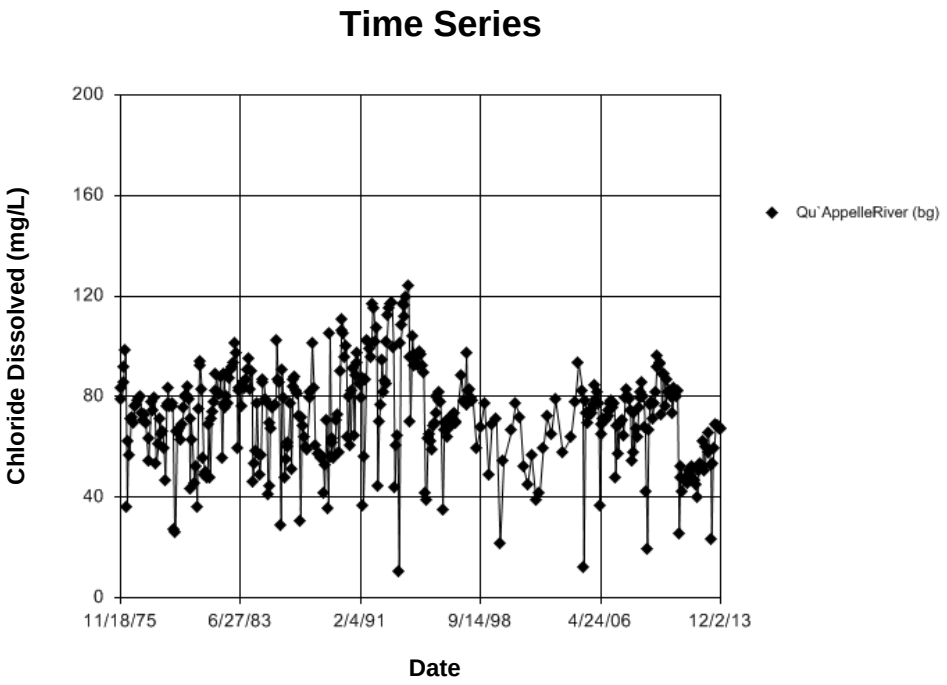


Figure C136 Qu'Appelle River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 56.97
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 13 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 56.97
Adjusted Kruskal-Wallis statistic (H') = 56.97

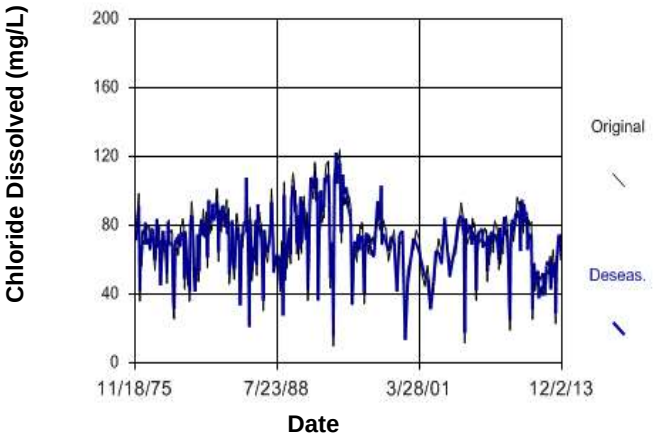


Figure C137 Qu'Appelle River: Chloride Dissolved

Seasonal Kendall

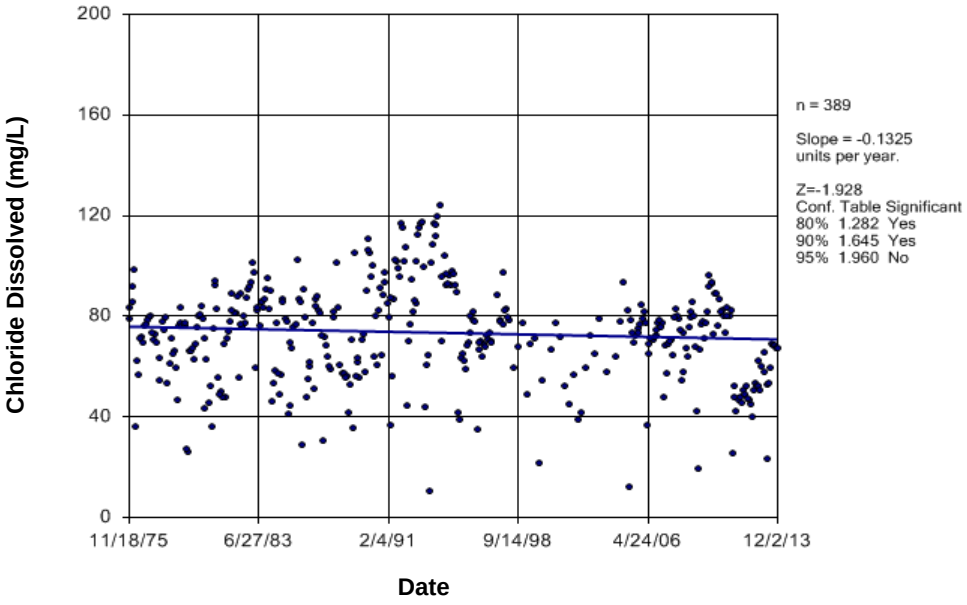


Figure C138 Qu'Appelle River: Chloride Dissolved

Time Series

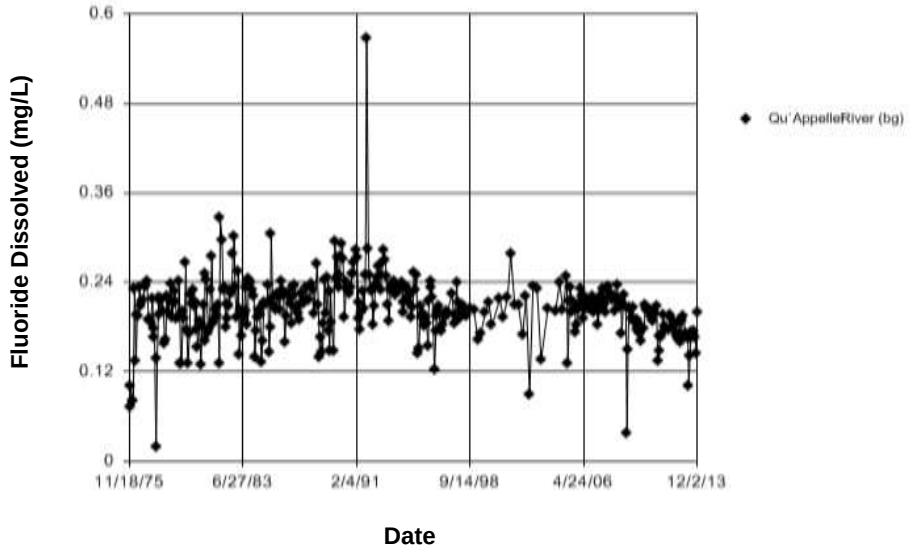


Figure C139 Qu'Appelle River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 12.14
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 48 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 12.14
Adjusted Kruskal-Wallis statistic (H') = 12.14

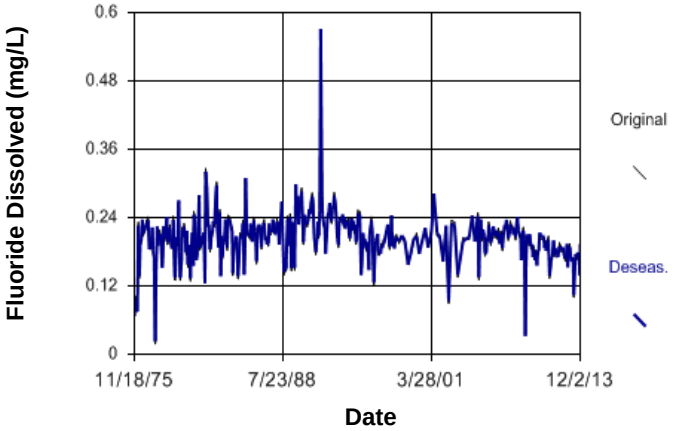


Figure C140 Qu'Appelle River: Fluoride Dissolved

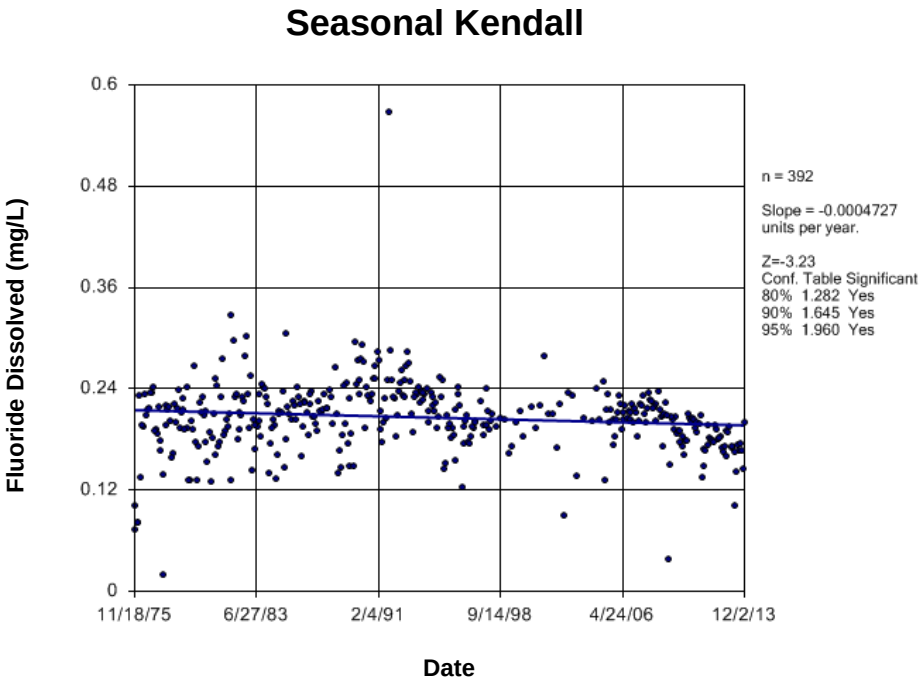


Figure C141 Qu'Appelle River: Fluoride Dissolved

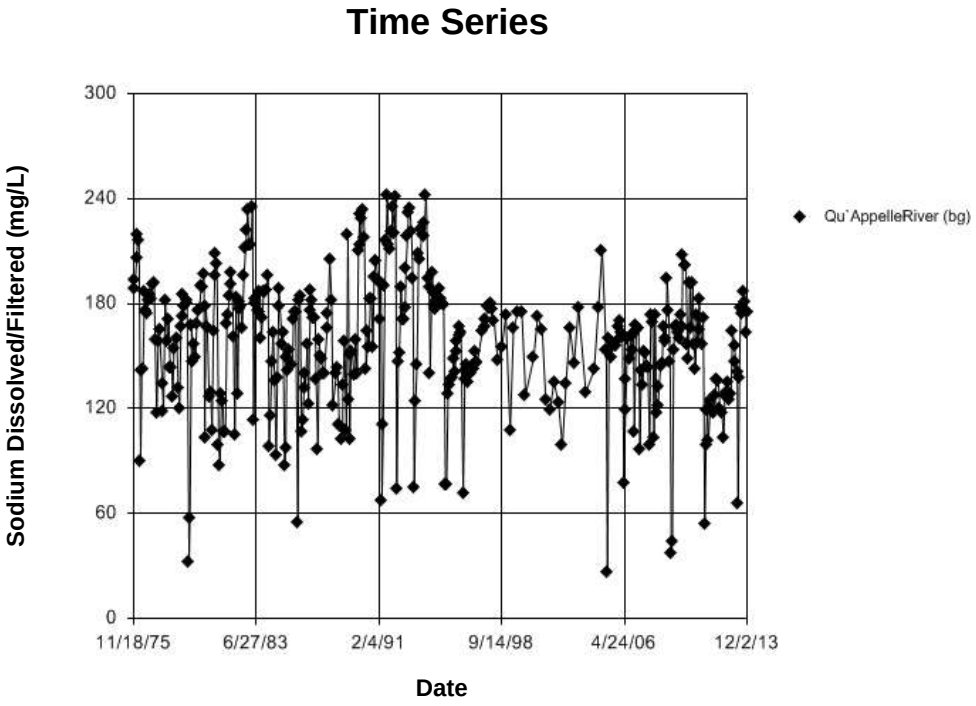


Figure C142 Qu'Appelle River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 48.15
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 45 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 48.15
Adjusted Kruskal-Wallis statistic (H') = 48.15

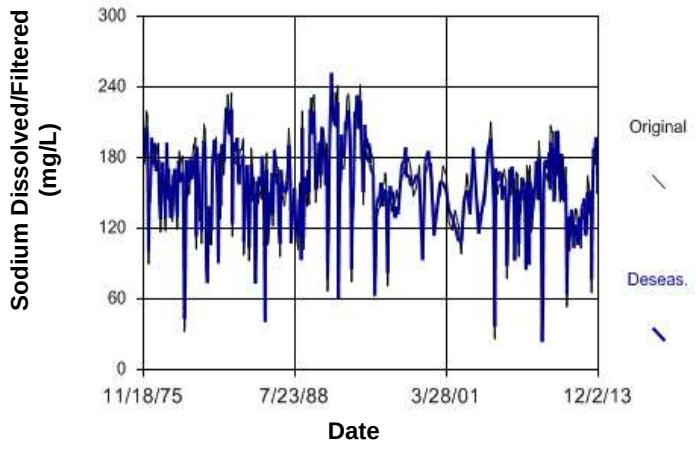


Figure C143 Qu'Appelle River: Sodium Dissolved/Filtered

Seasonal Kendall

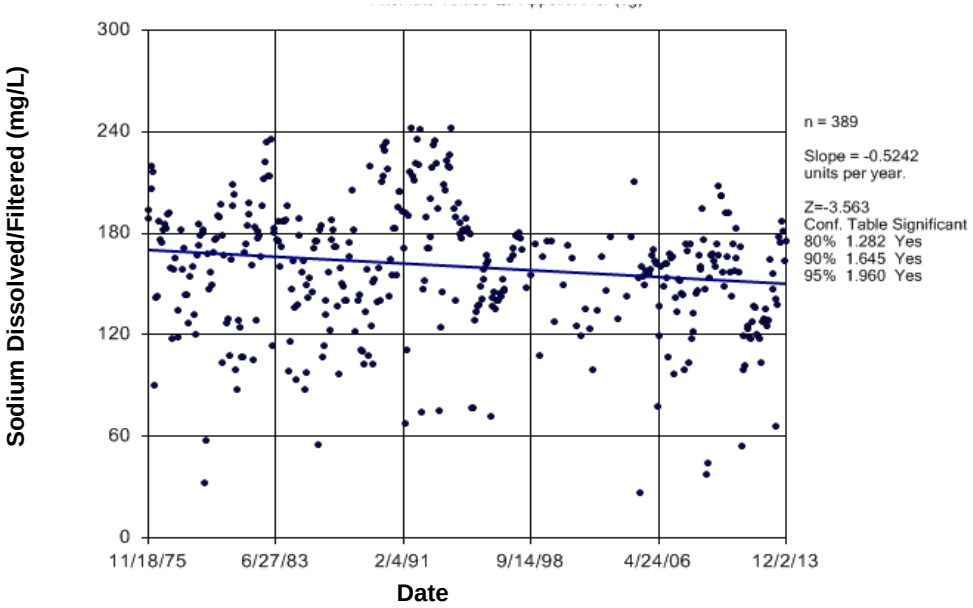


Figure C144 Qu'Appelle River: Sodium Dissolved/Filtered

Time Series

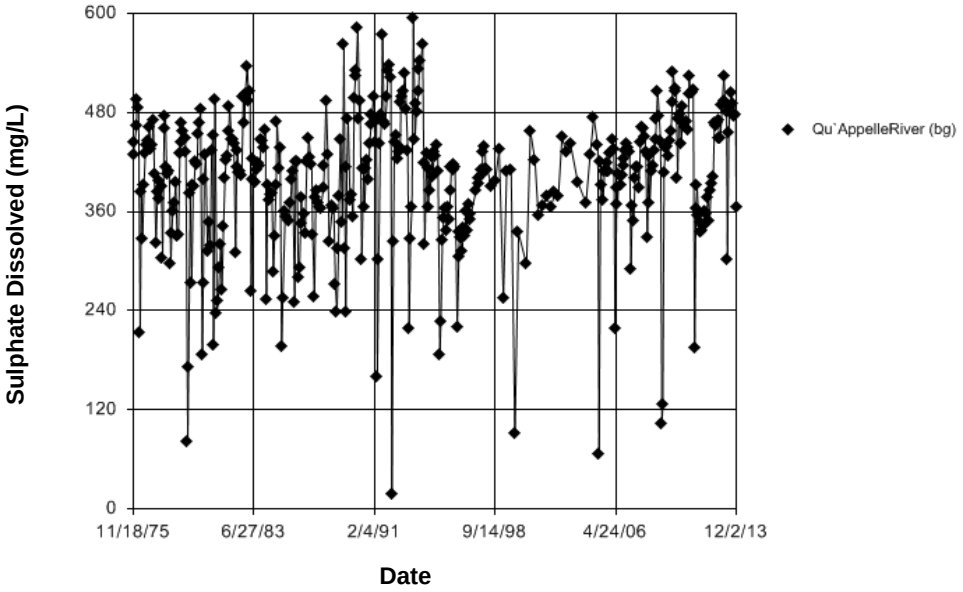


Figure C145 Qu'Appelle River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 59.33
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 25 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 59.33
Adjusted Kruskal-Wallis statistic (H') = 59.33

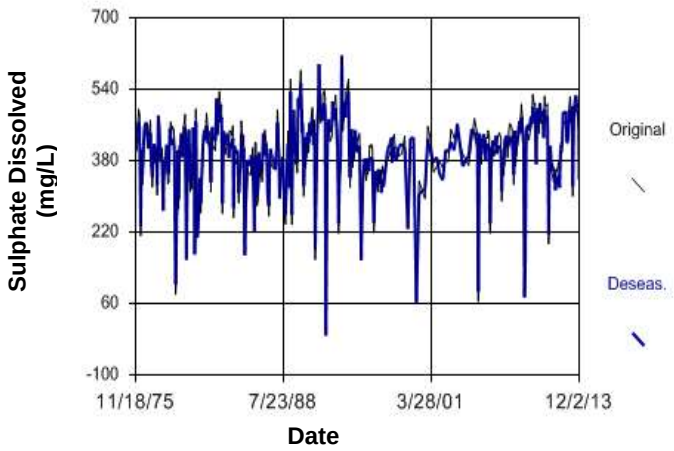


Figure C146 Qu'Appelle River: Sulphate Dissolved

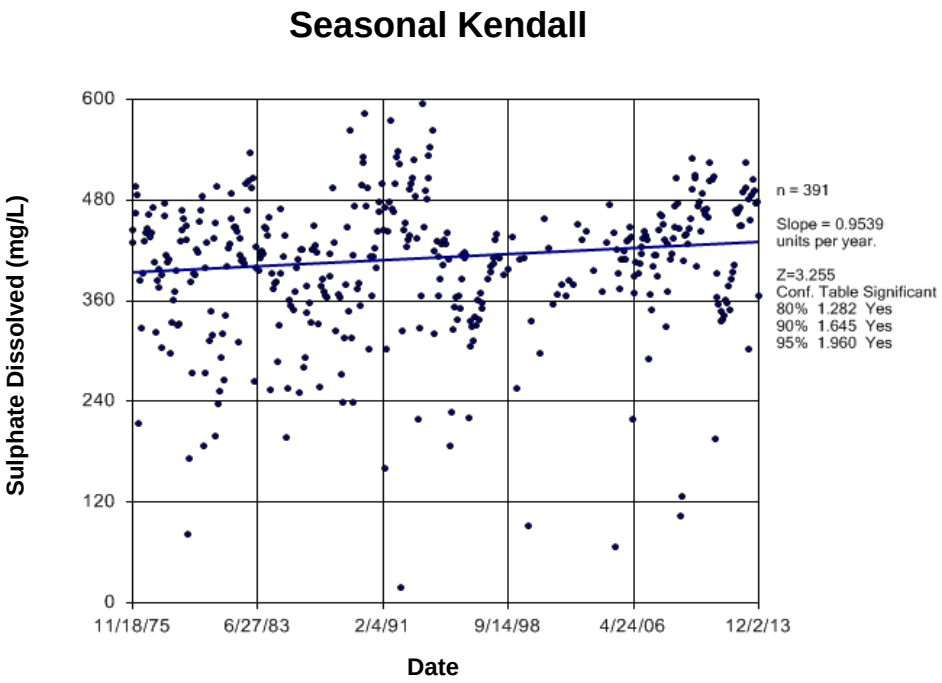


Figure C147 Qu'Appelle River: Sulphate Dissolved

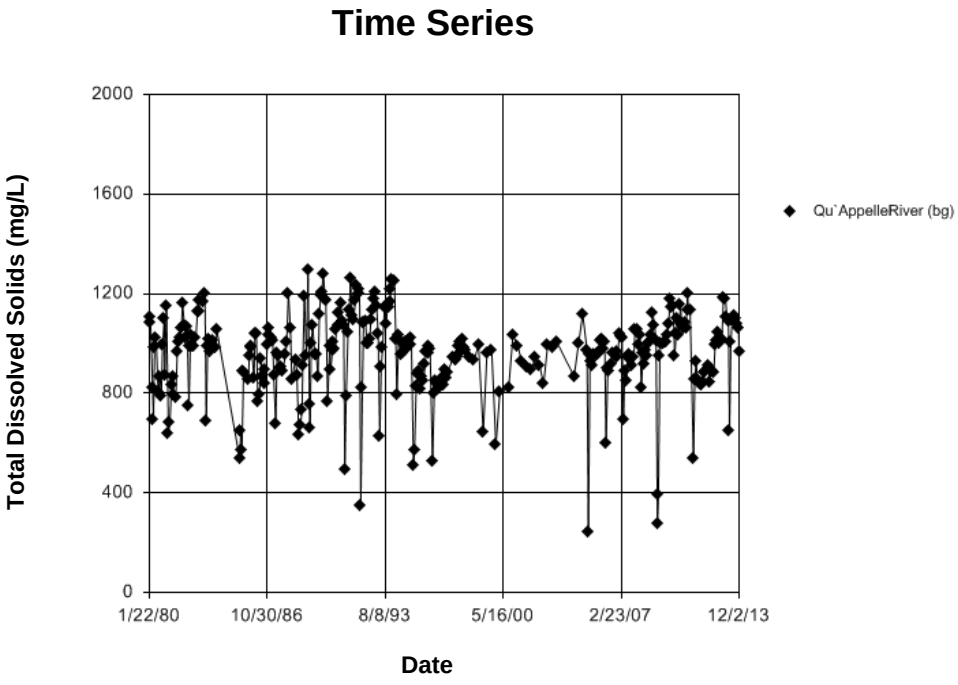


Figure C148 Qu'Appelle River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 41.82
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 41 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 41.82
Adjusted Kruskal-Wallis statistic (H') = 41.82

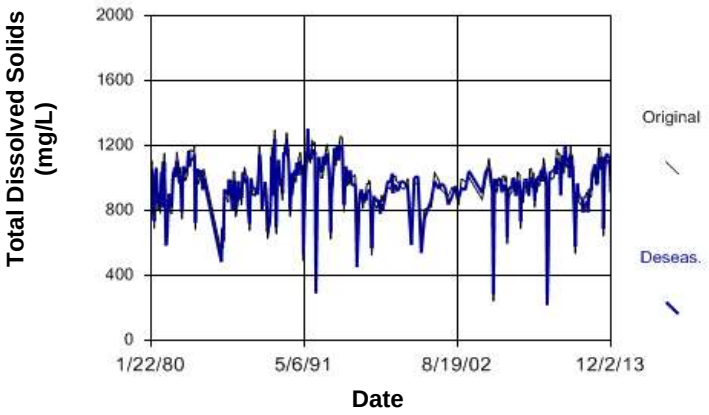


Figure C149 Qu'Appelle River: Total Dissolved Solids

Seasonal Kendall

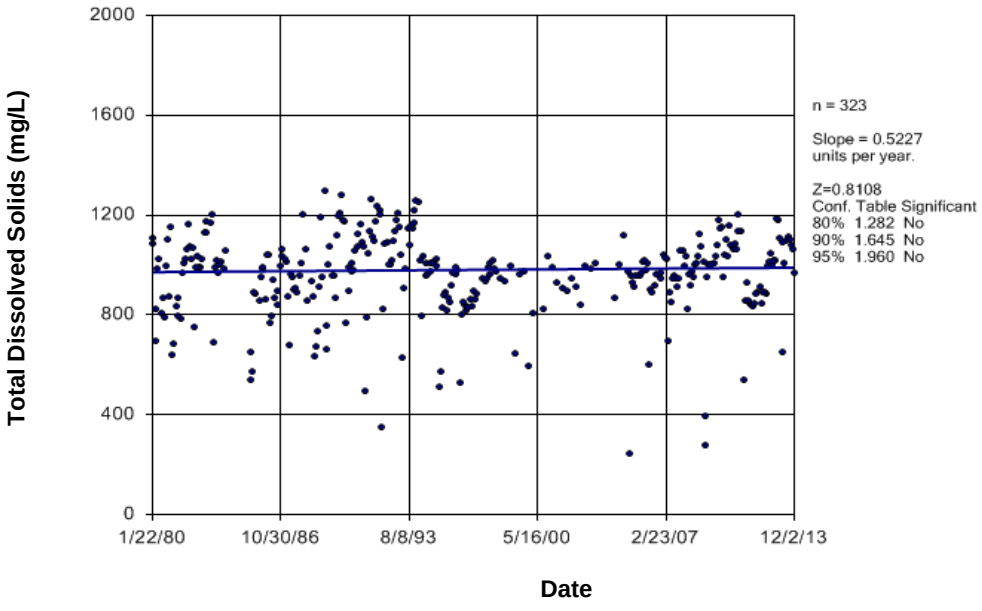


Figure C150 Qu'Appelle River: Total Dissolved Solids

Time Series

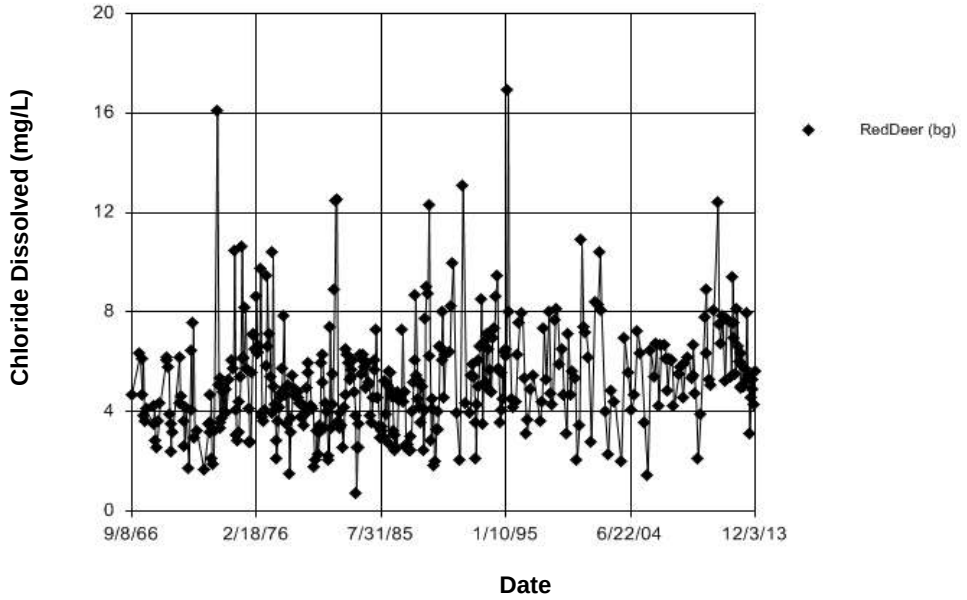


Figure C151 Red Deer River (SK-MB): Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 52.86
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 52.86
Adjusted Kruskal-Wallis statistic (H') = 52.86

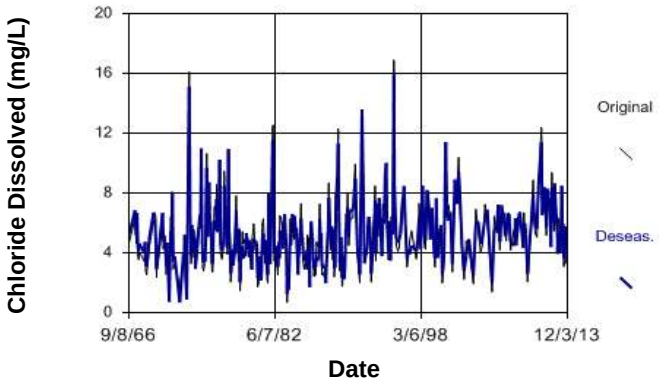


Figure C152 Red Deer River (SK-MB): Chloride Dissolved

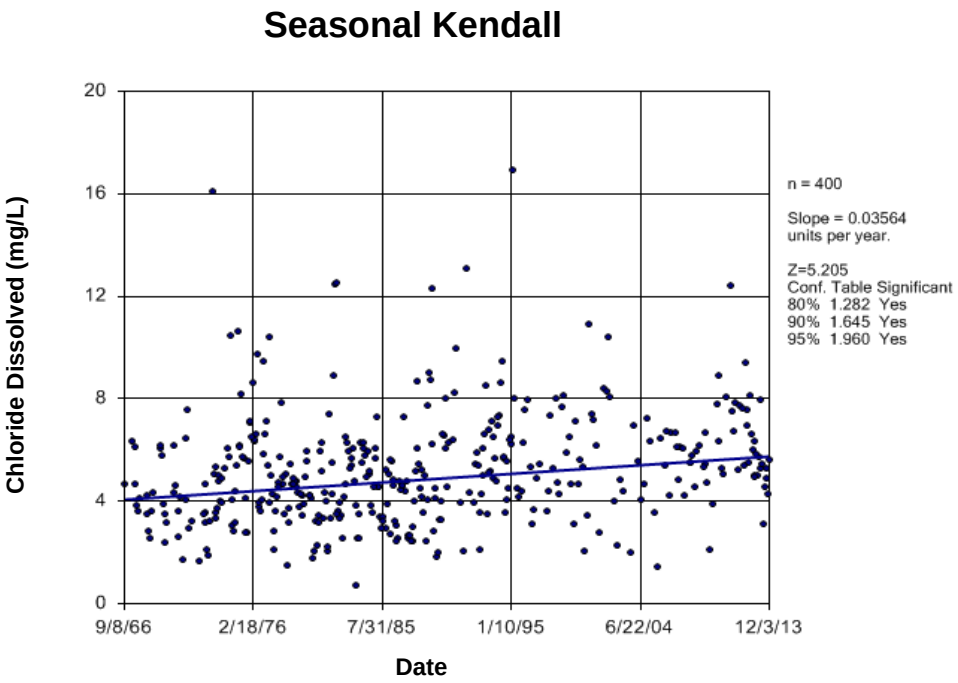


Figure C153 Red Deer River (SK-MB): Chloride Dissolved

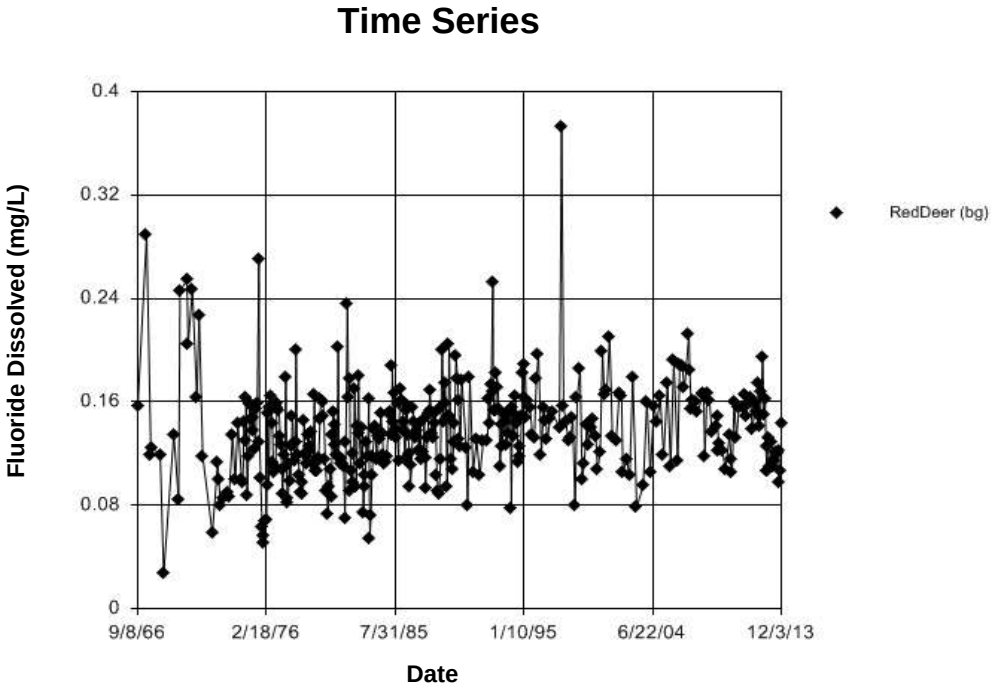


Figure C154 Red Deer River (SK-MB): Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 19.45
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 48 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 19.45
Adjusted Kruskal-Wallis statistic (H') = 19.45

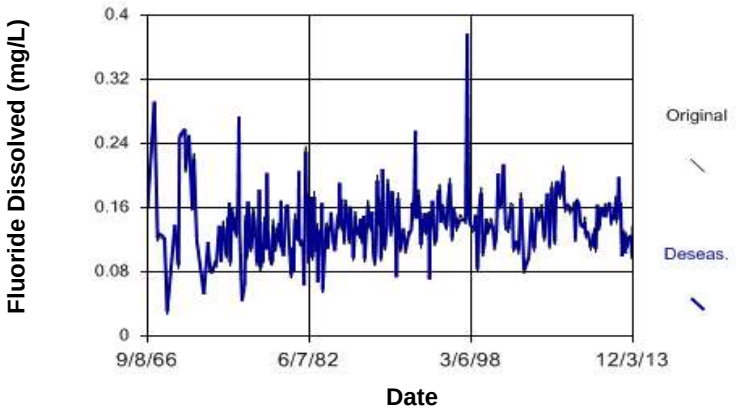


Figure C155 Red Deer River (SK-MB): Fluoride Dissolved

Seasonal Kendall

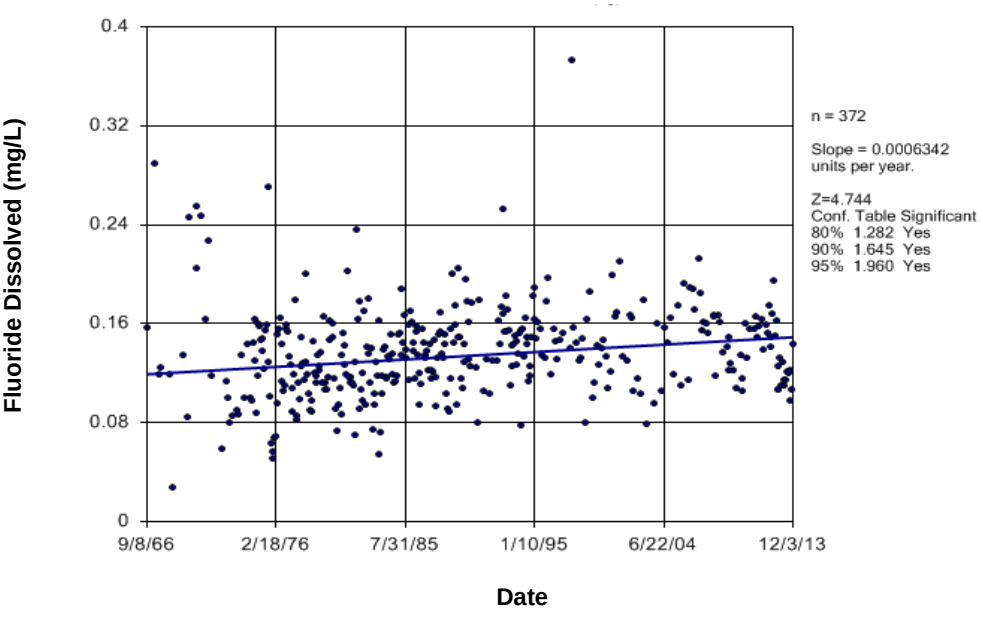


Figure C156 Red Deer River (SK-MB): Fluoride Dissolved

Time Series

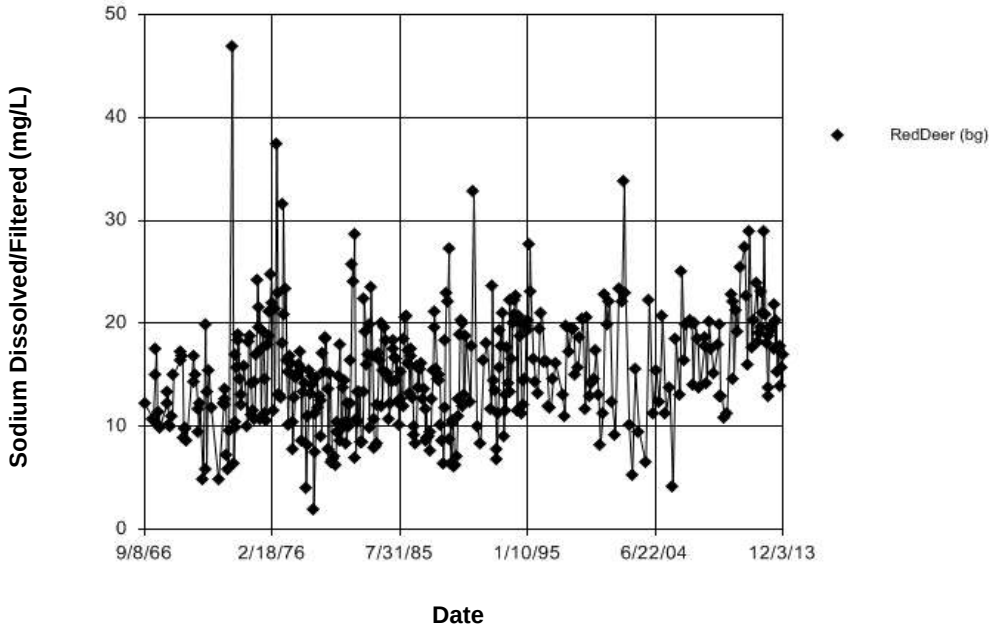


Figure C157 Red Deer River (SK-MB): Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 72.83
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 36 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 72.83
Adjusted Kruskal-Wallis statistic (H') = 72.83

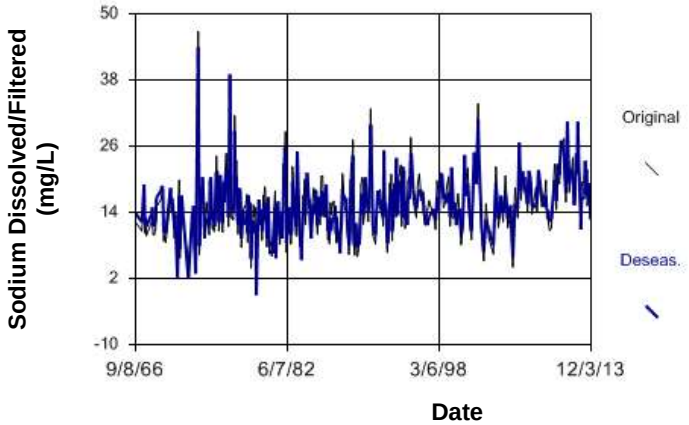


Figure C158 Red Deer River (SK-MB): Sodium Dissolved/Filtered

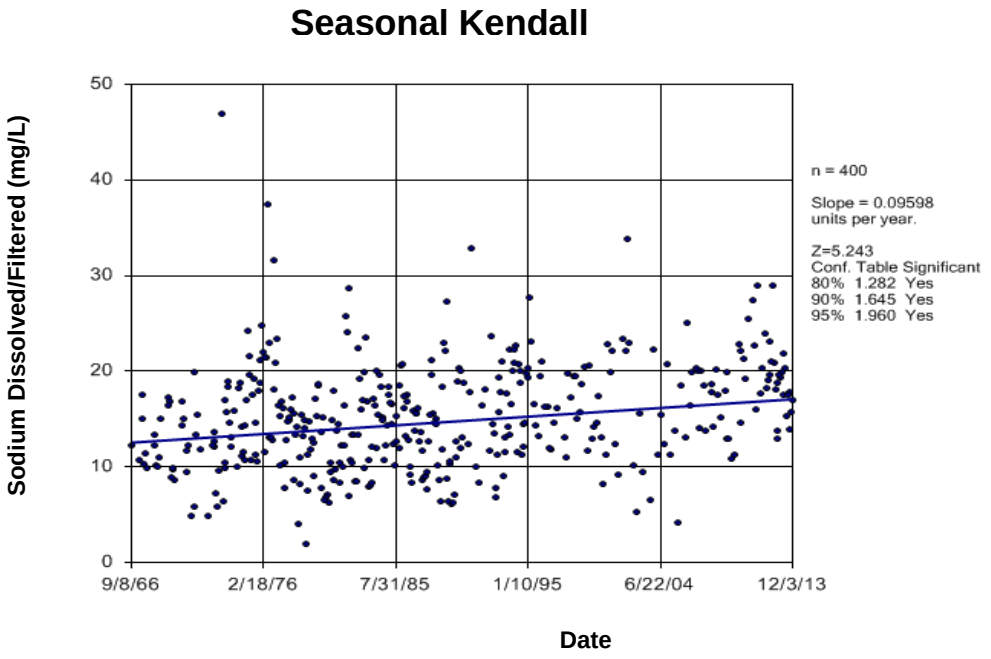


Figure C159 Red Deer River (SK-MB): Sodium Dissolved/Filtered

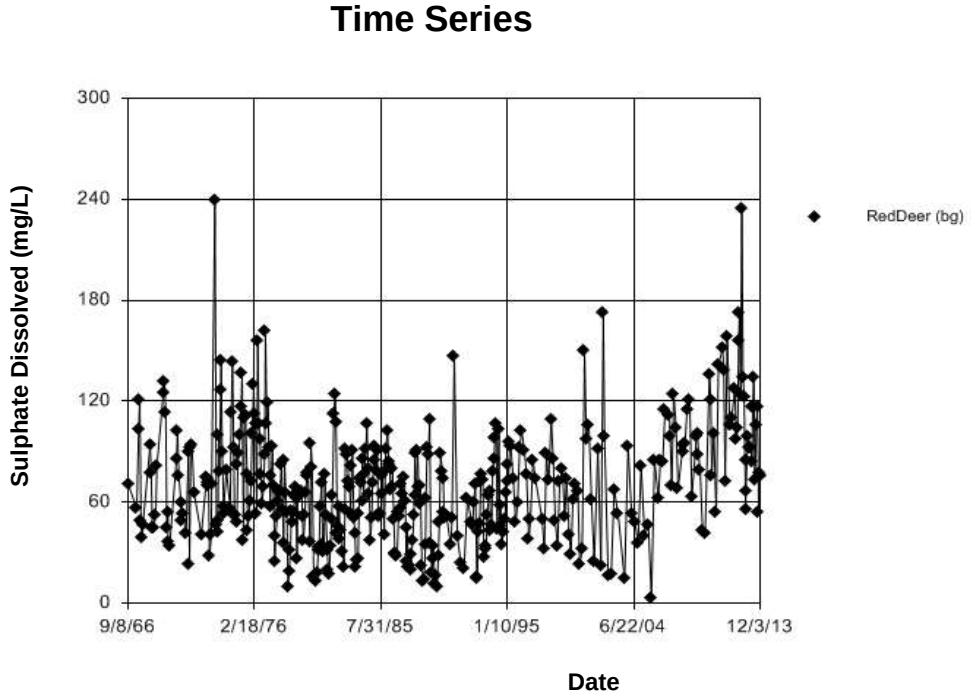


Figure C160 Red Deer River (SK-MB): Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 32.86
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 32.86
Adjusted Kruskal-Wallis statistic (H') = 32.86

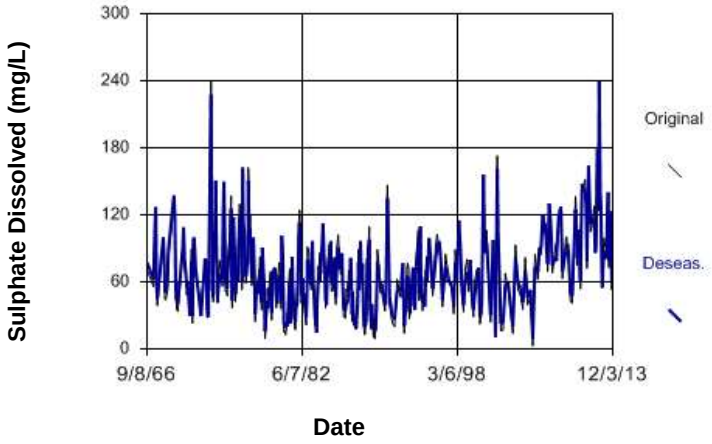


Figure C161 Red Deer River (SK-MB): Sulphate Dissolved

Seasonal Kendall

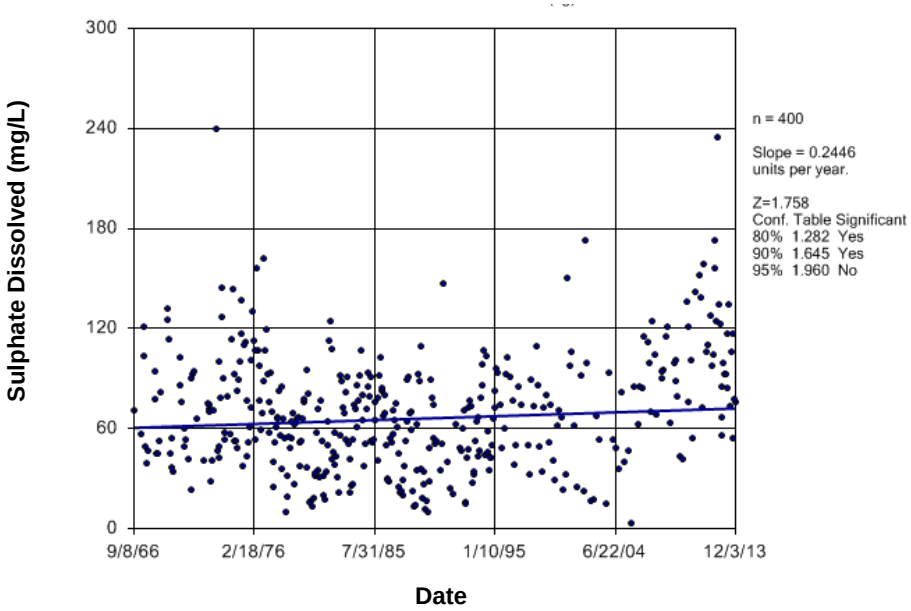


Figure C162 Red Deer River (SK-MB): Sulphate Dissolved

Time Series

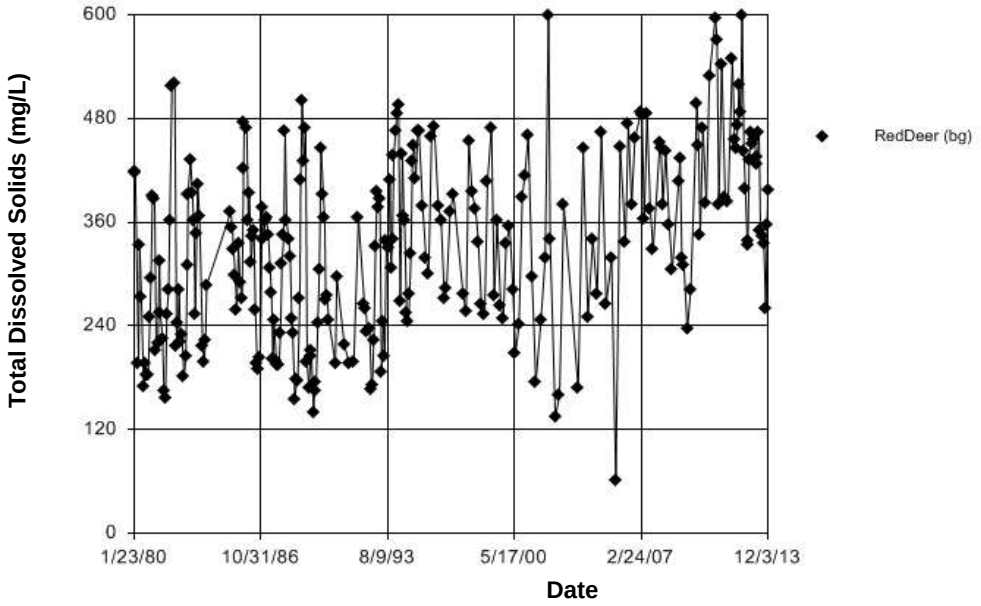


Figure C163 Red Deer River (SK-MB): Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 73.54
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 14 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 73.54
Adjusted Kruskal-Wallis statistic (H') = 73.54

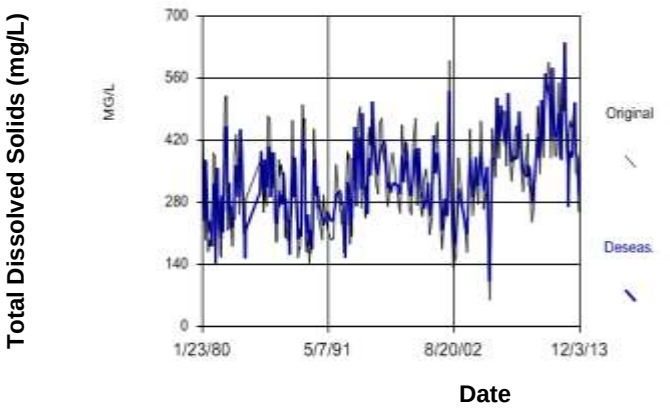


Figure C164 Red Deer River (SK-MB): Total Dissolved Solids

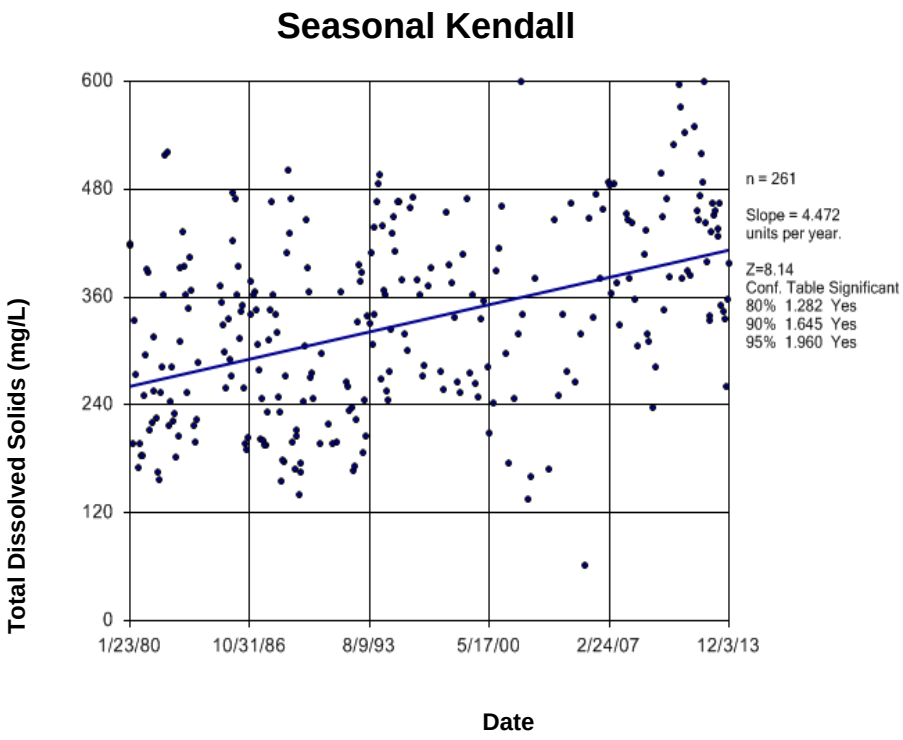


Figure C165 Red Deer River (SK-MB): Total Dissolved Solids

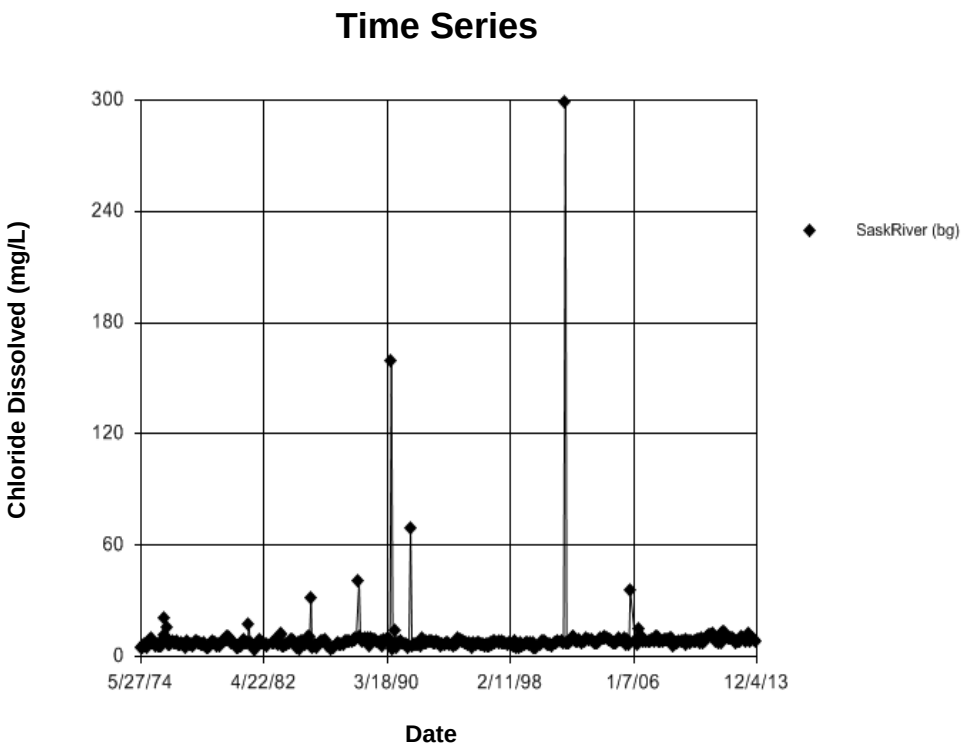


Figure C166 Saskatchewan River: Chloride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 28.92
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 28.92
Adjusted Kruskal-Wallis statistic (H') = 28.92

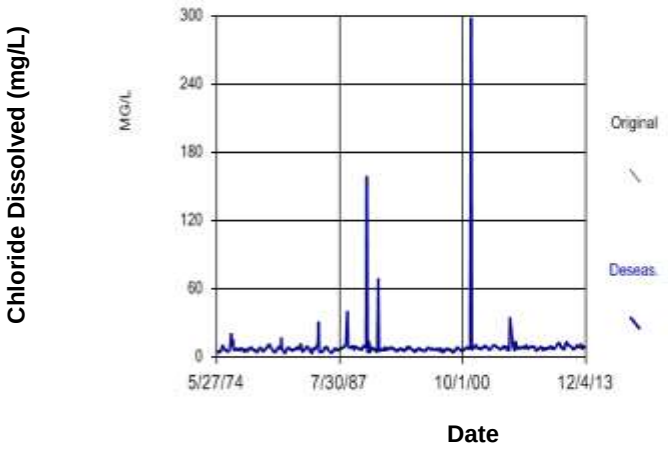


Figure C167 Saskatchewan River: Chloride Dissolved

Seasonal Kendall

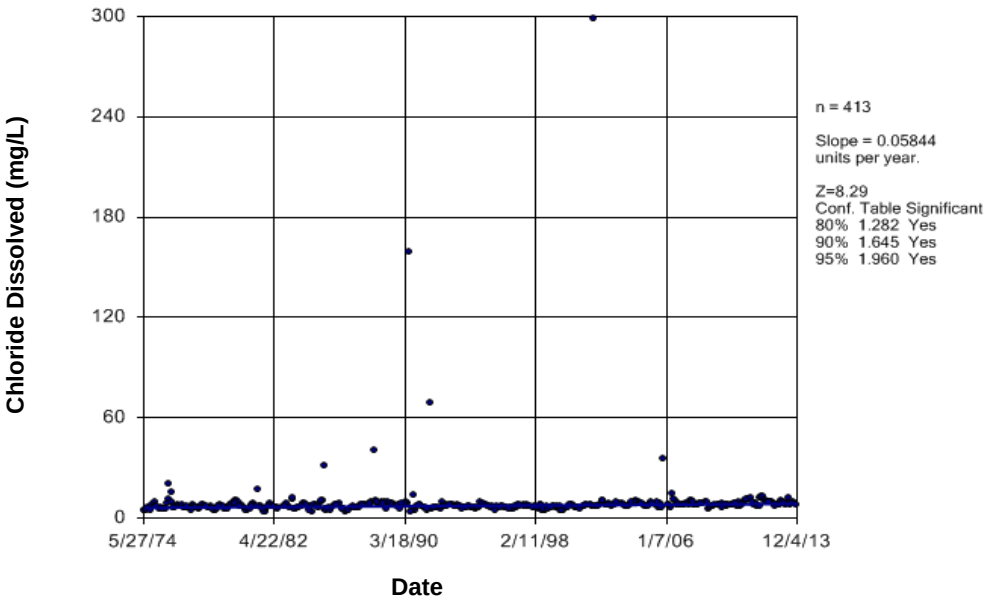


Figure C168 Saskatchewan River: Chloride Dissolved

Time Series

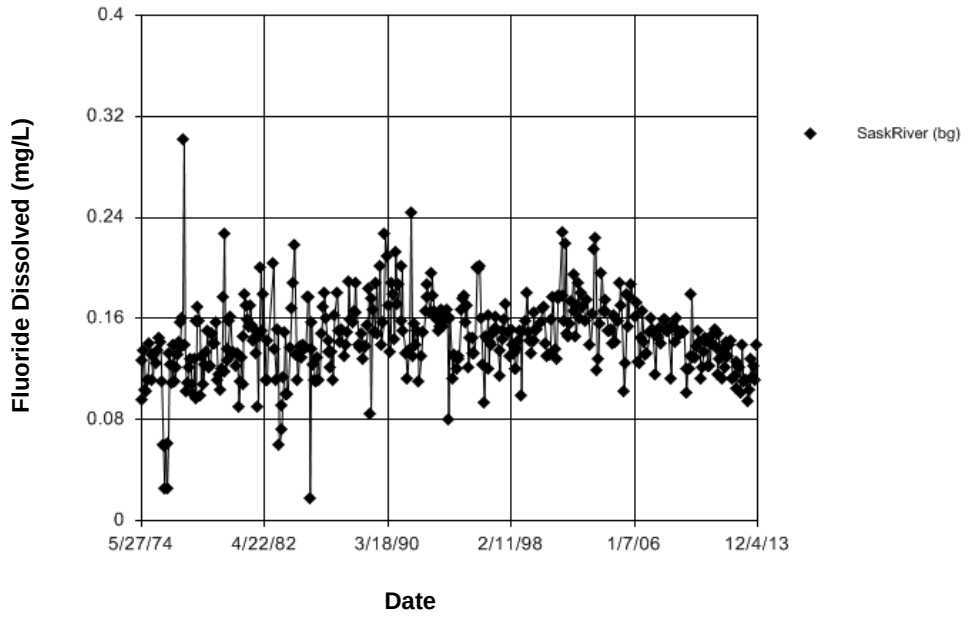


Figure C169 Saskatchewan River: Fluoride Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 36.92
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 71 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 36.92
Adjusted Kruskal-Wallis statistic (H') = 36.92

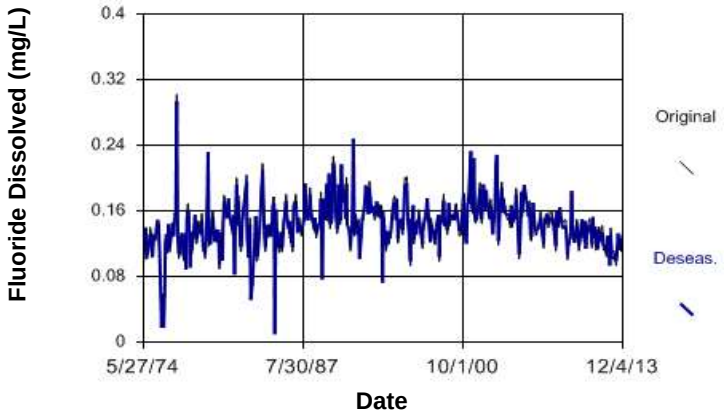


Figure C170 Saskatchewan River: Fluoride Dissolved

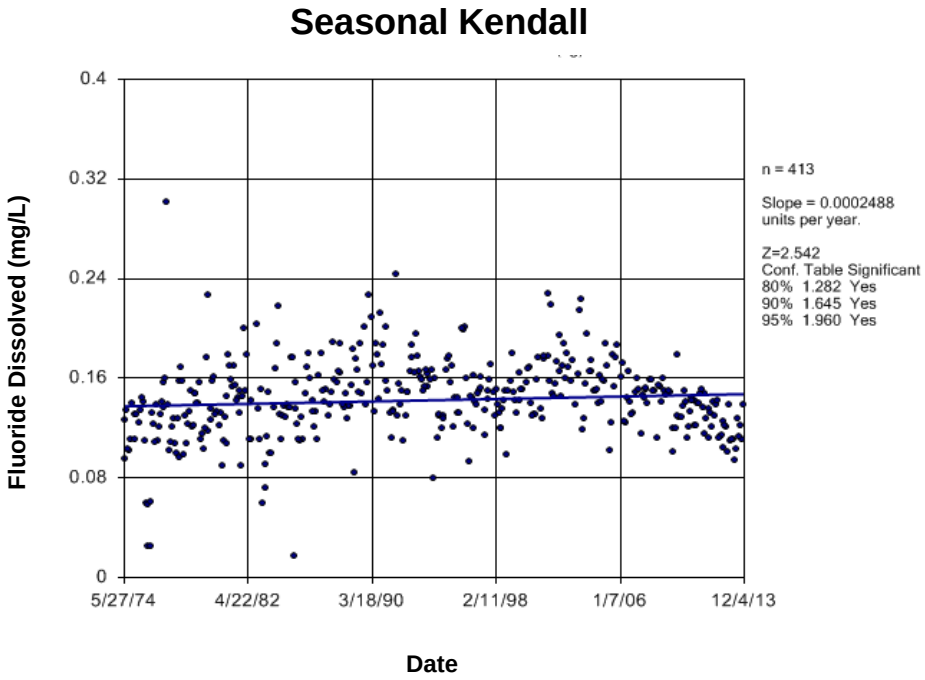


Figure C171 Saskatchewan River: Fluoride Dissolved

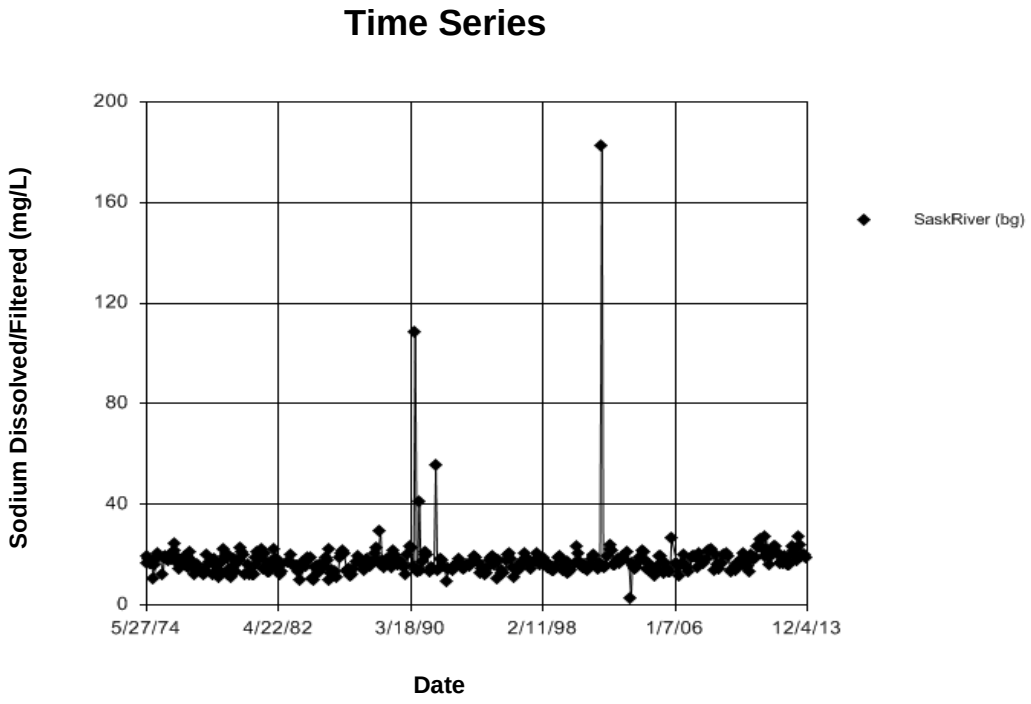


Figure C172 Saskatchewan River: Sodium Dissolved/Filtered

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 107.9
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 59 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 107.9
Adjusted Kruskal-Wallis statistic (H') = 107.9

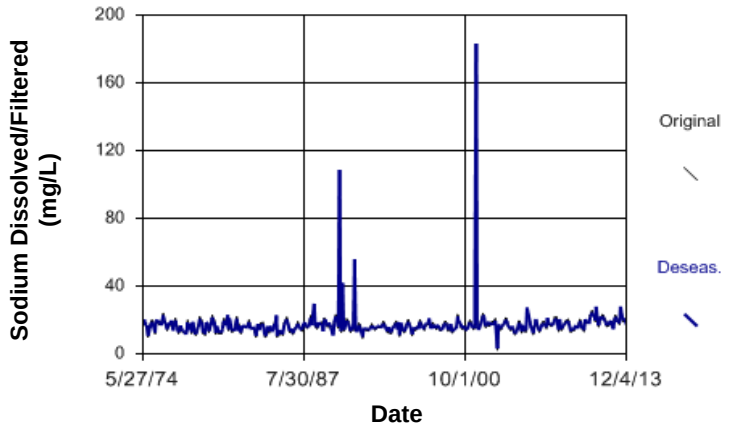


Figure C173 Saskatchewan River: Sodium Dissolved/Filtered

Seasonal Kendall

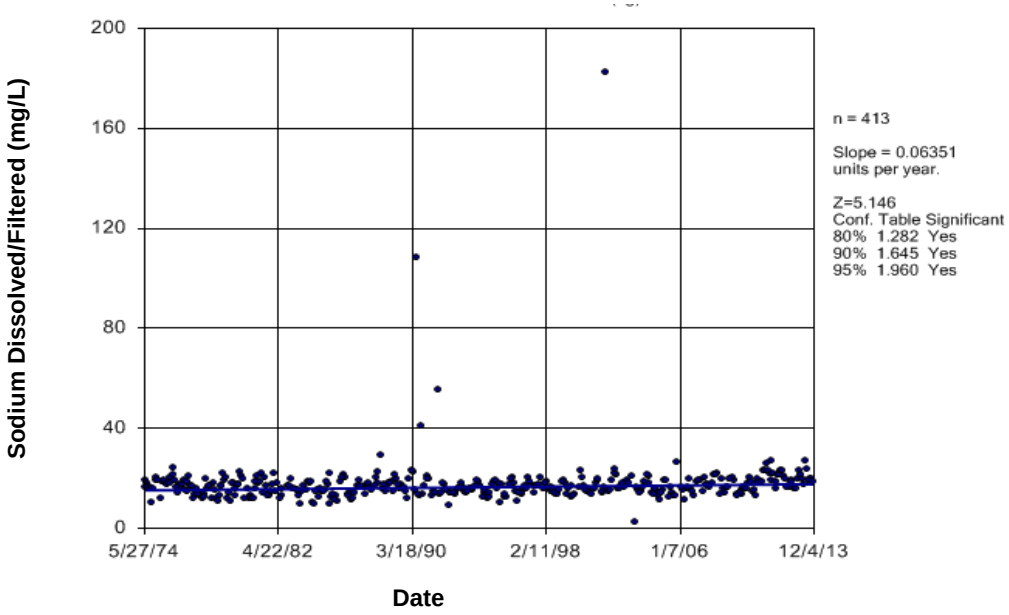


Figure C174 Saskatchewan River: Sodium Dissolved/Filtered

Time Series

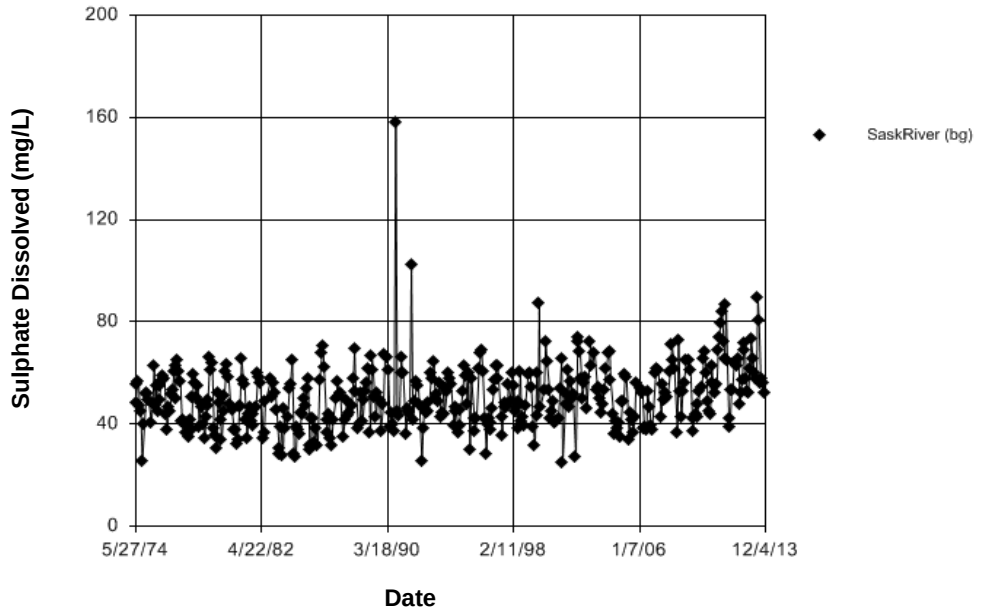


Figure C175 Saskatchewan River: Sulphate Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 125.9
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 125.9
Adjusted Kruskal-Wallis statistic (H') = 125.9

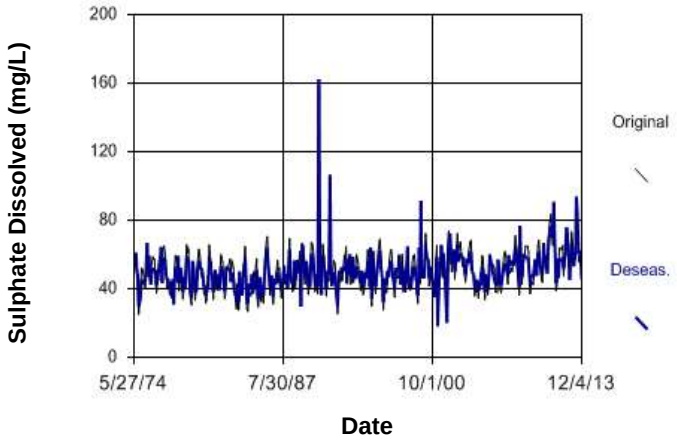


Figure C176 Saskatchewan River: Sulphate Dissolved

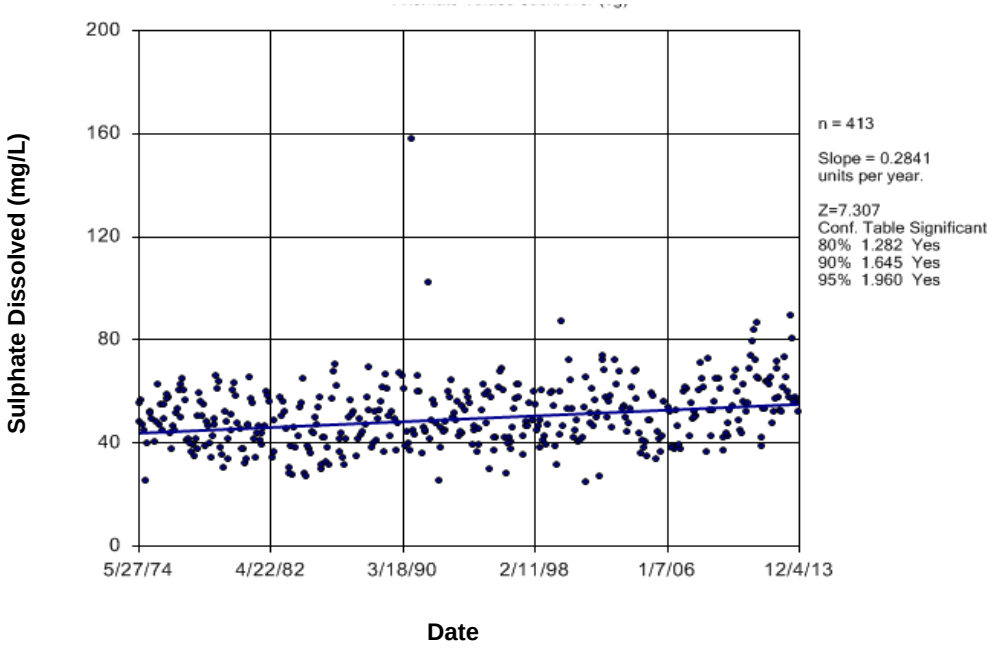


Figure C177 Saskatchewan River: Sulphate Dissolved

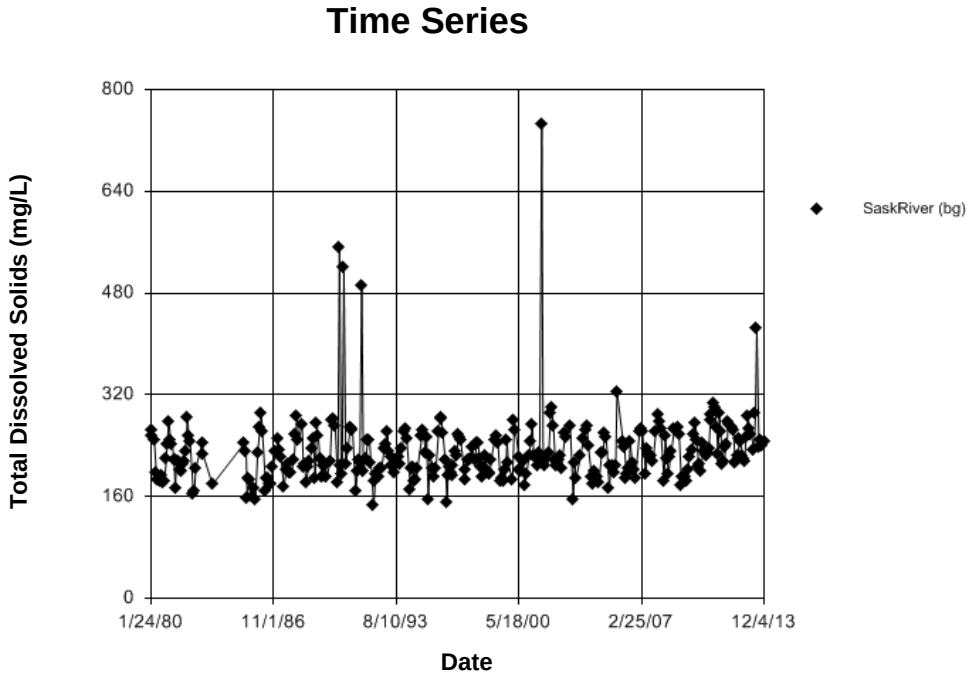


Figure C178 Saskatchewan River: Total Dissolved Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 138.5
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 38 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 138.5
Adjusted Kruskal-Wallis statistic (H') = 138.5

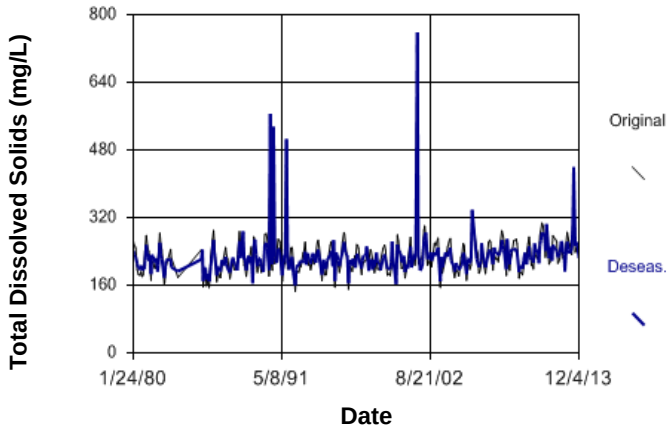


Figure C179 Saskatchewan River: Total Dissolved Solids

Seasonal Kendall

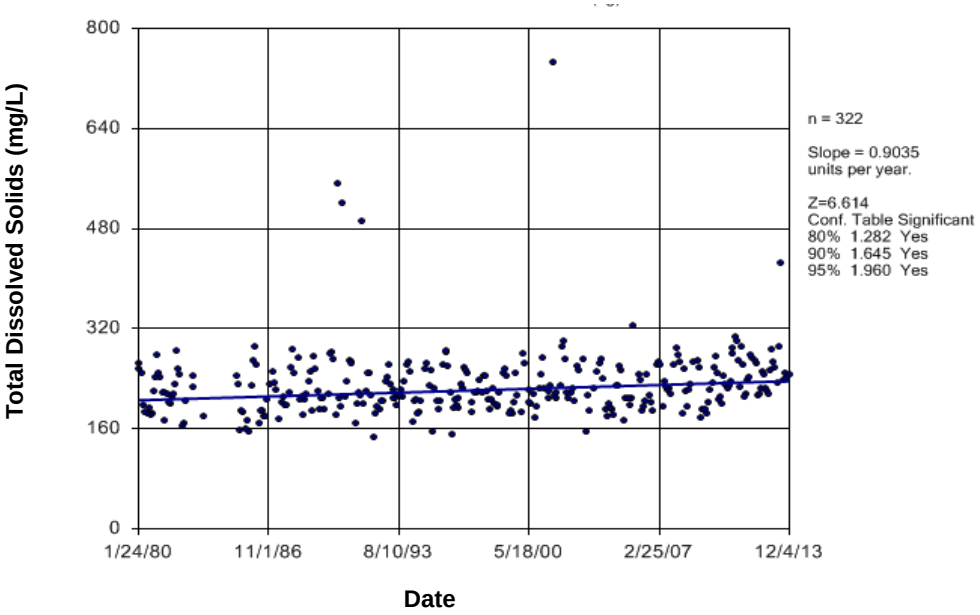


Figure C180 Saskatchewan River: Total Dissolved Solids

Appendix D: Physicals Trending Graphs

Time Series

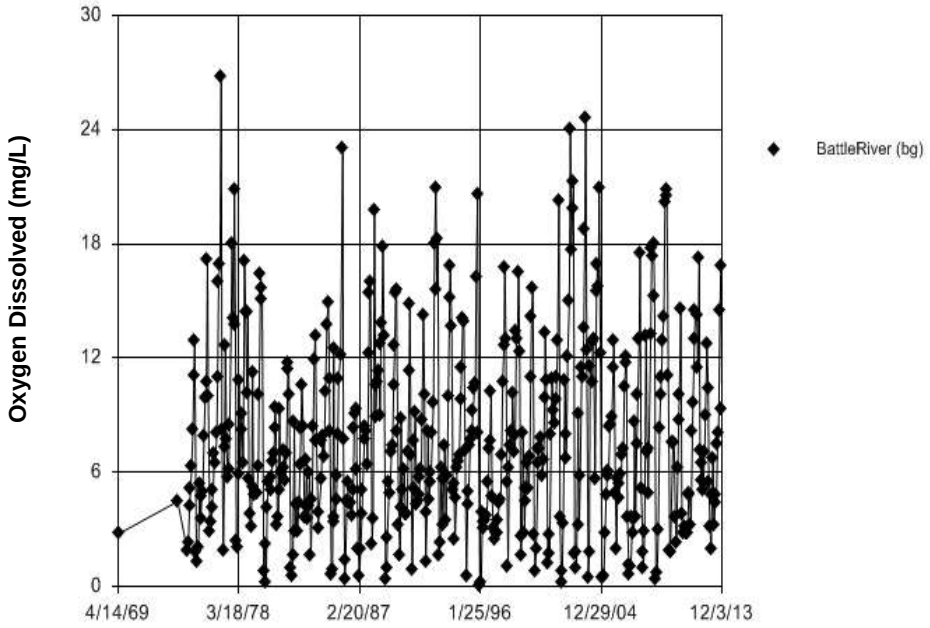


Figure D1 Battle River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 11.07
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 13 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 11.07
Adjusted Kruskal-Wallis statistic (H') = 11.07

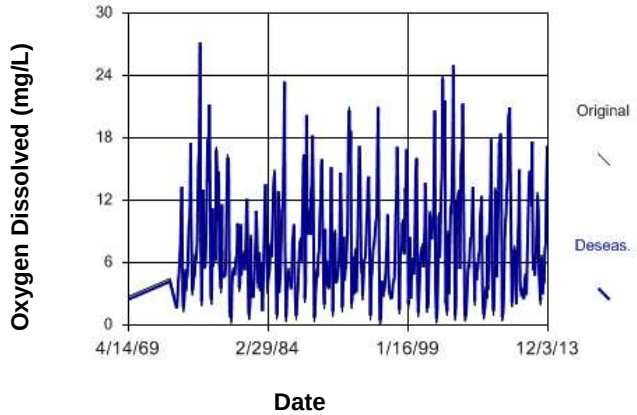


Figure D2 Battle River: Oxygen Dissolved

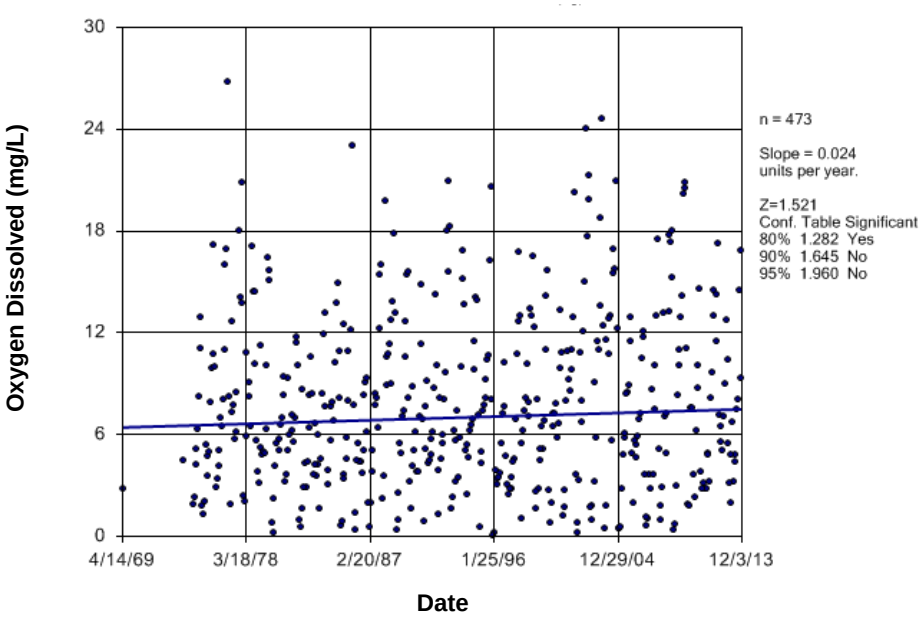


Figure D3 Battle River: Oxygen Dissolved

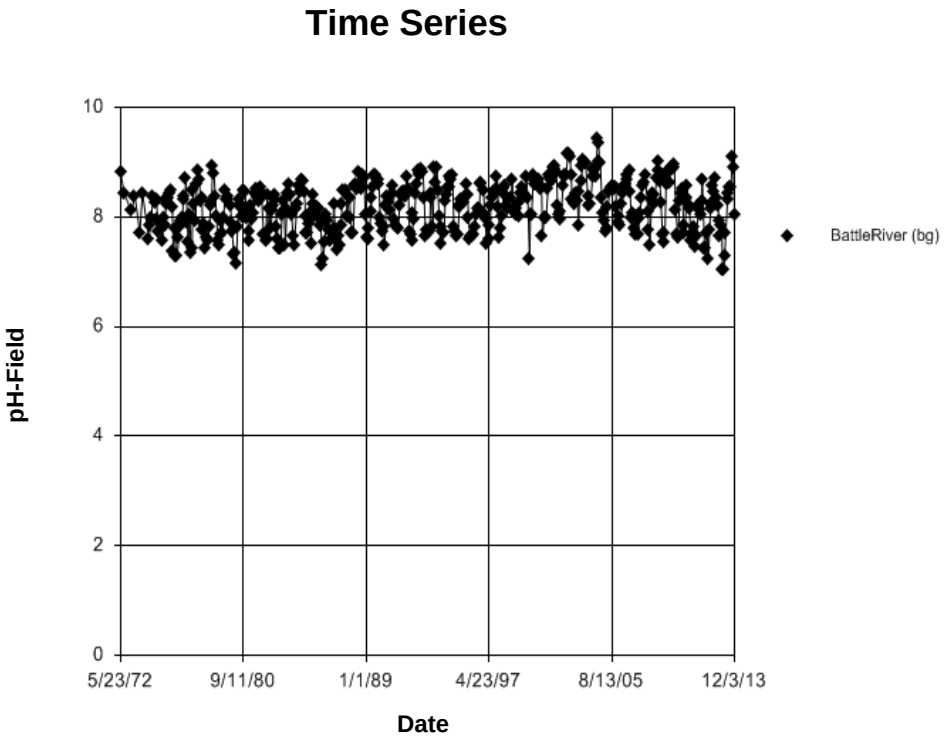


Figure D4 Battle River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 115
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 56 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 115
Adjusted Kruskal-Wallis statistic (H') = 115

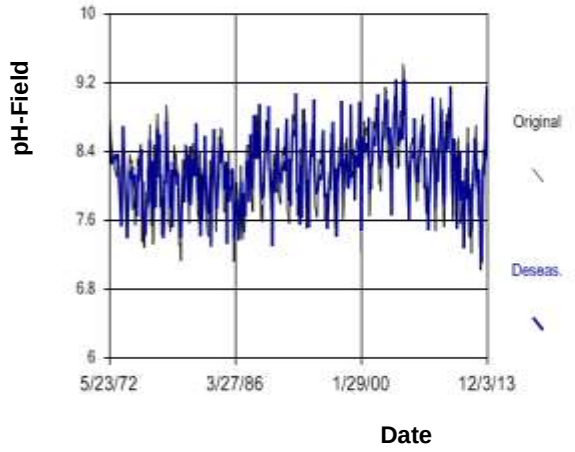


Figure D5 Battle River: pH-Field

Seasonal Kendall

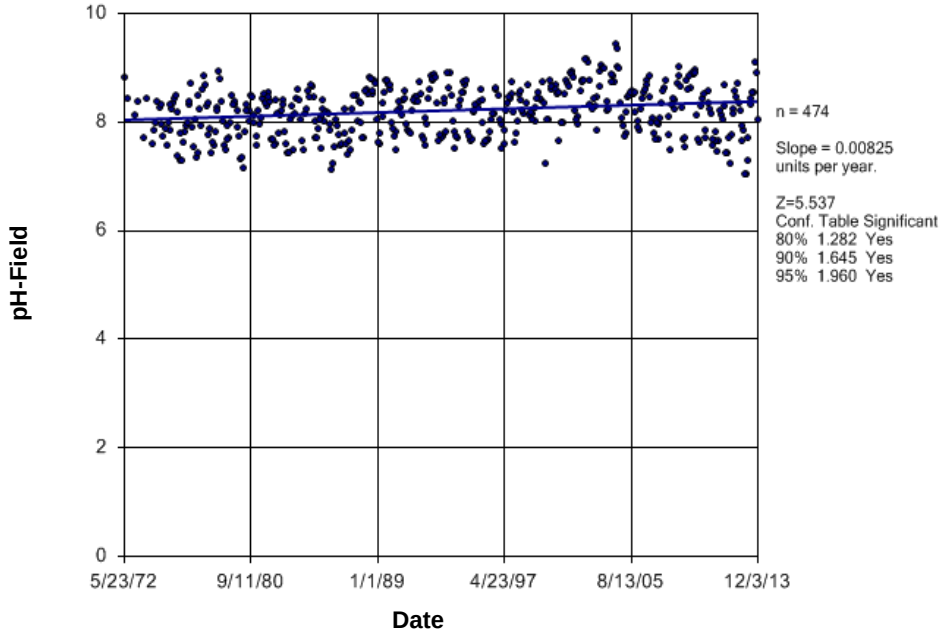


Figure D6 Battle River: pH-Field

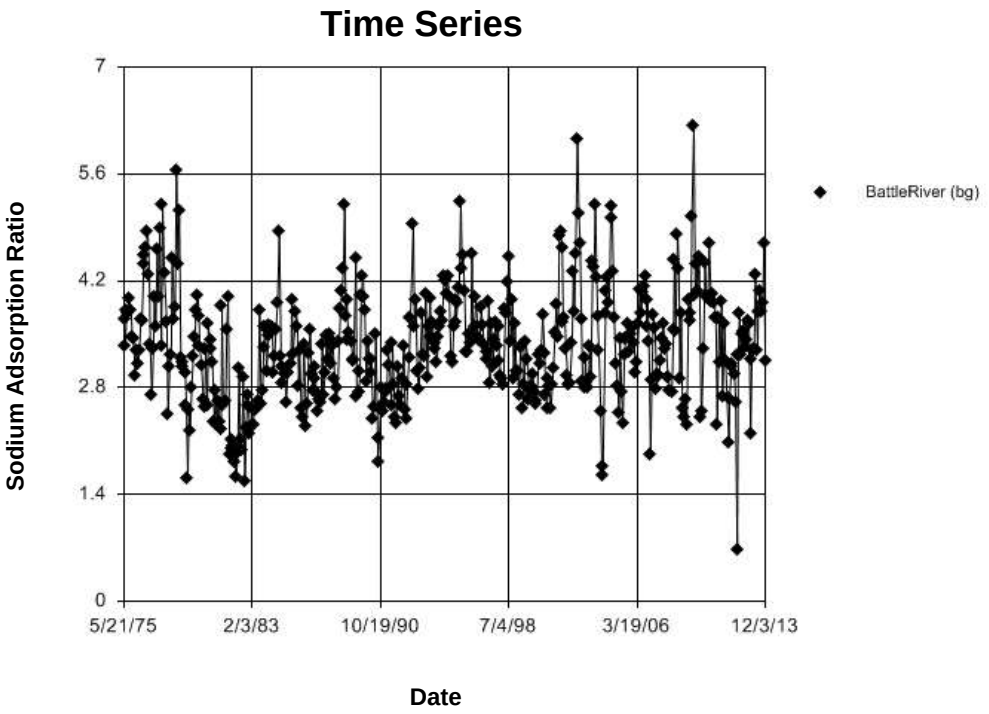


Figure D7 Battle River: Sodium Adsorption Ratio

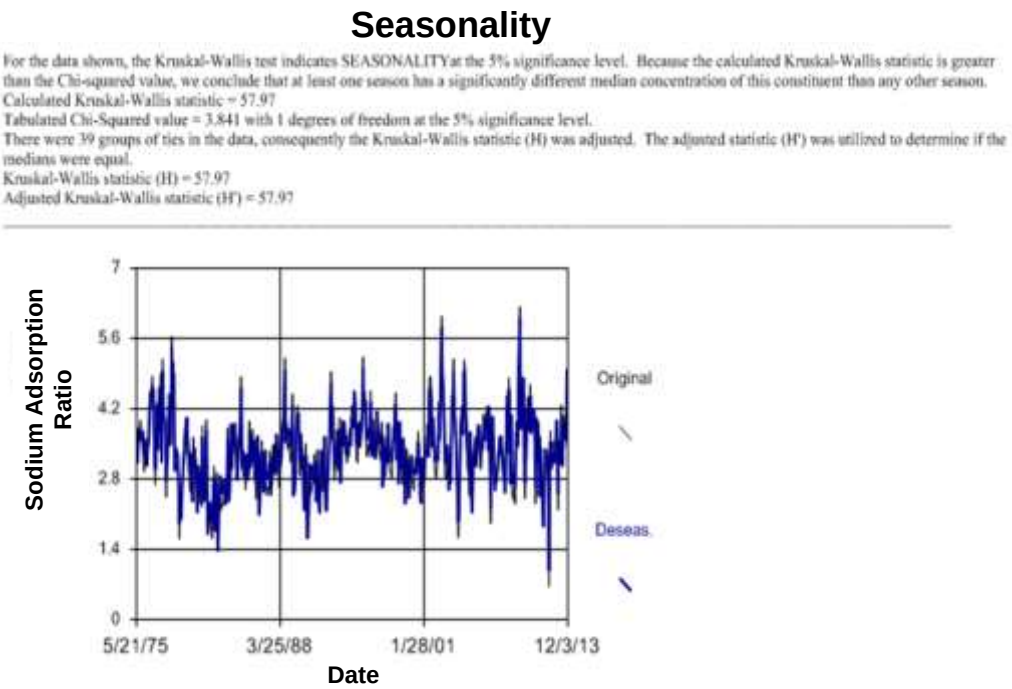


Figure D8 Battle River: Sodium Adsorption Ratio

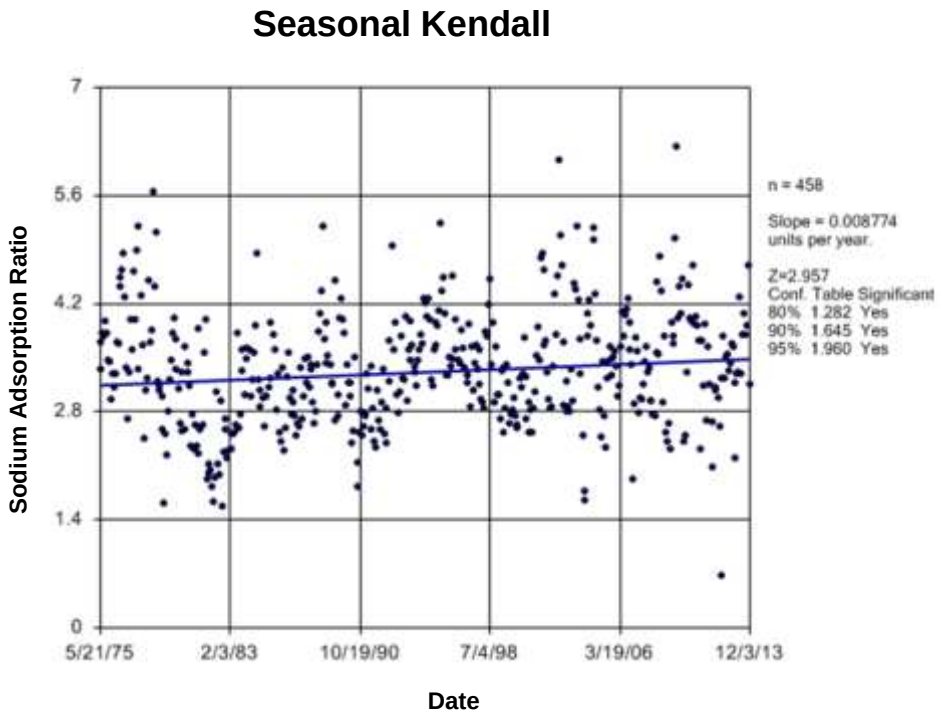


Figure D9 Battle River: Sodium Adsorption Ratio

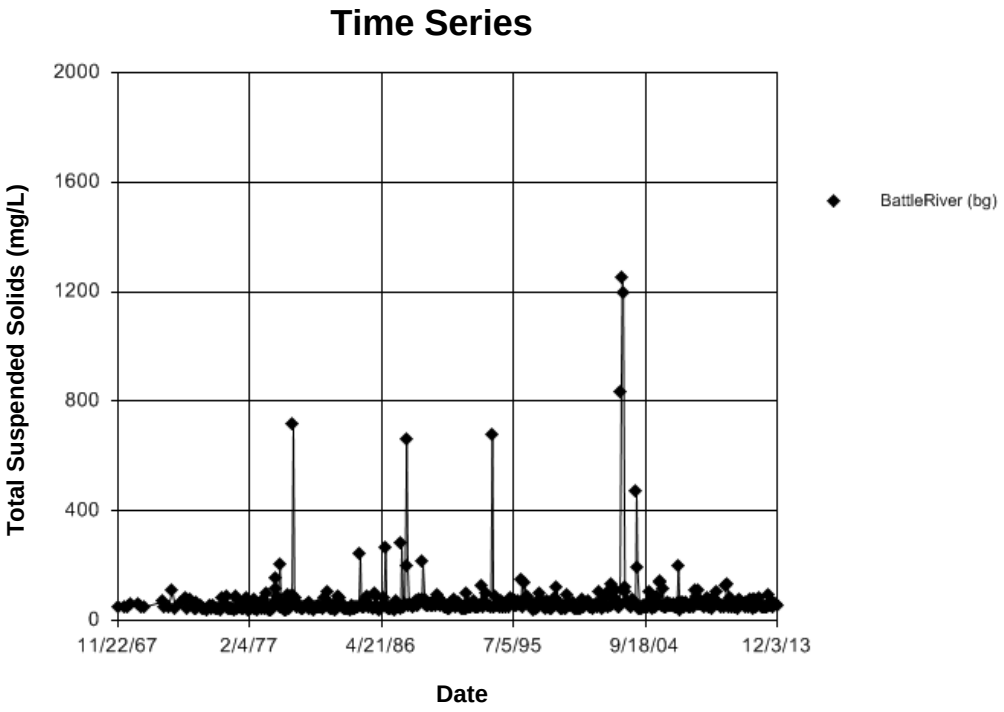


Figure D10 Battle River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 19.77
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 30 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 19.77
Adjusted Kruskal-Wallis statistic (H') = 19.77

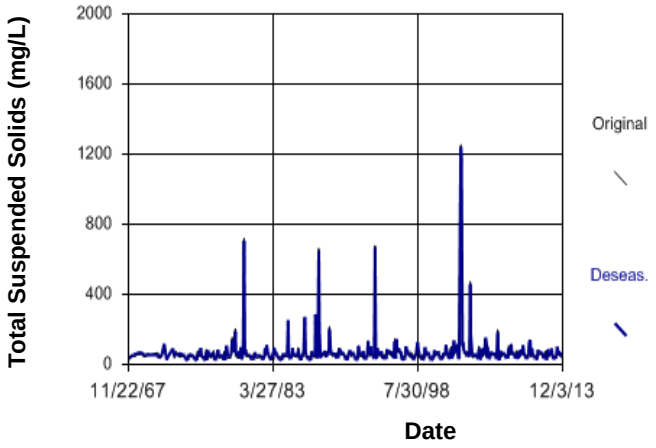


Figure D11 Battle River: Total Suspended Solids

Seasonal Kendall

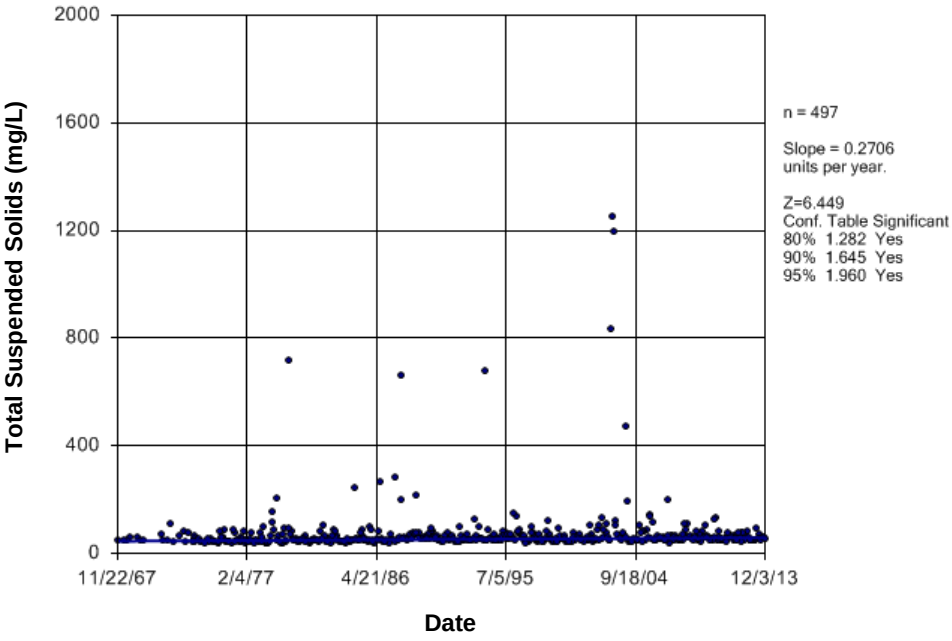


Figure D12 Battle River: Total Suspended Solids

Time Series

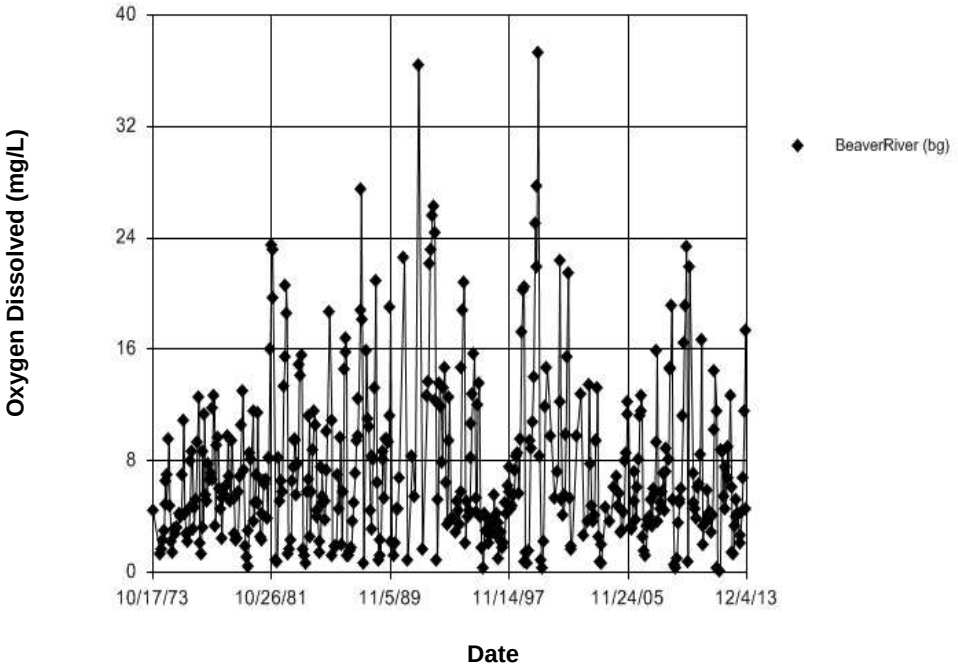


Figure D13 Beaver River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 39.05
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 39.05
Adjusted Kruskal-Wallis statistic (H') = 39.05

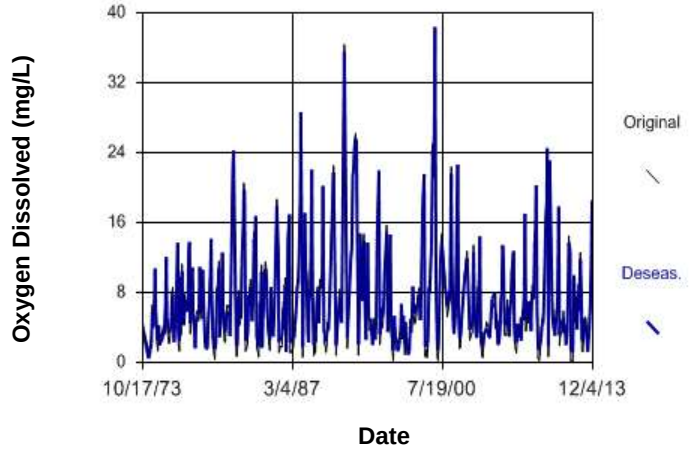


Figure D14 Beaver River: Oxygen Dissolved

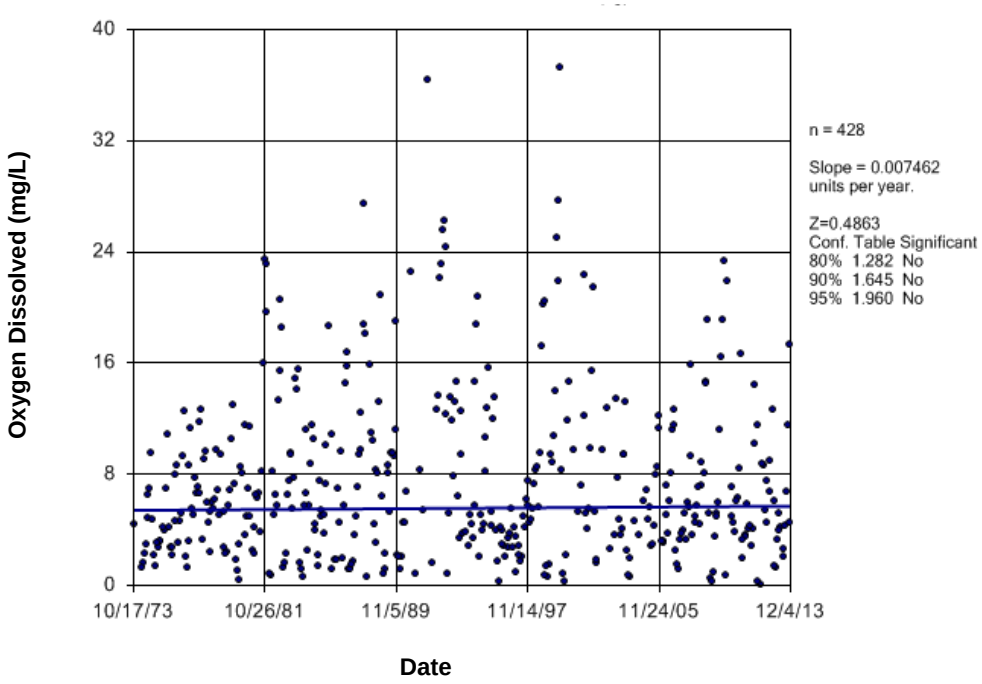


Figure D15 Beaver River: Oxygen Dissolved

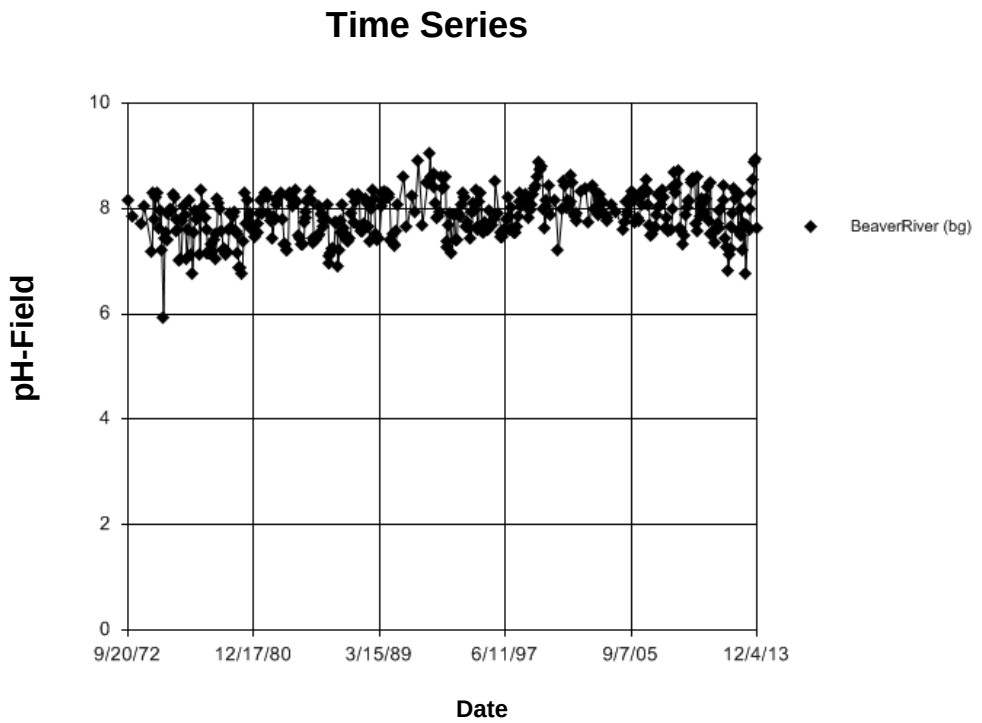


Figure D16 Beaver River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 99.06
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 53 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 99.06
Adjusted Kruskal-Wallis statistic (H') = 99.06

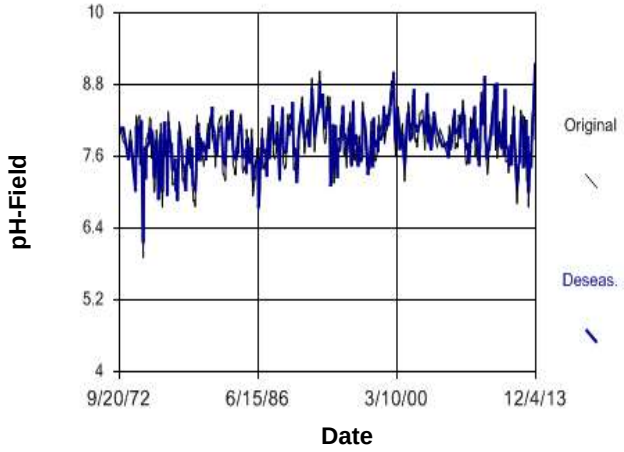


Figure D17 Beaver River: pH-Field

Seasonal Kendall

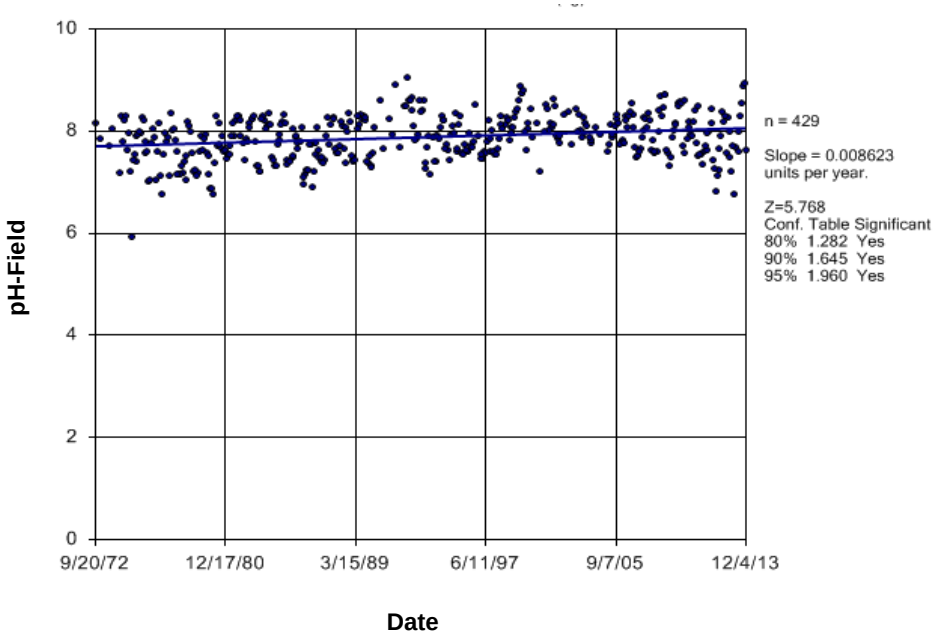


Figure D18 Beaver River: pH-Field

Time Series

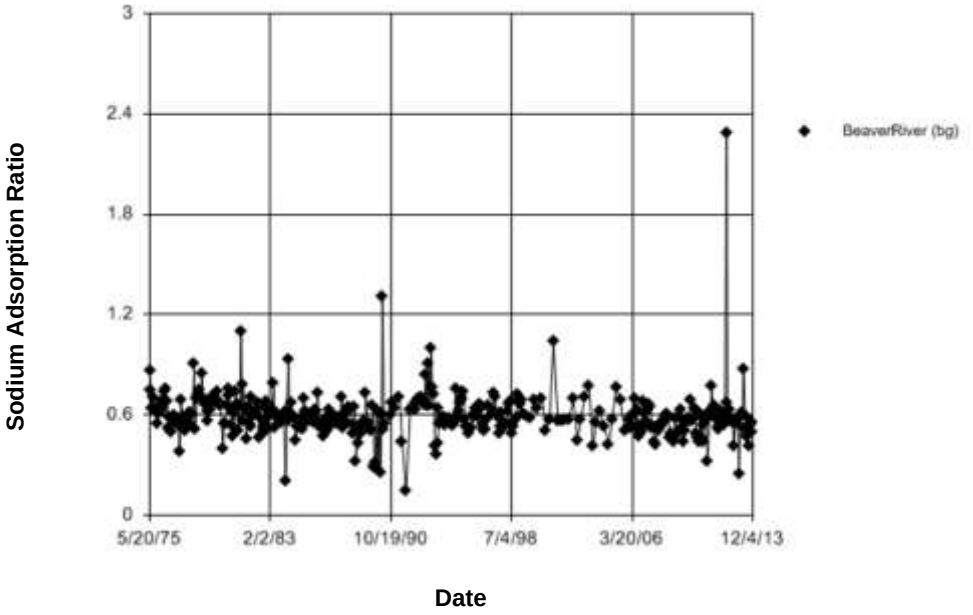


Figure D19 Beaver River: Sodium Adsorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.013
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 20 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.013
Adjusted Kruskal-Wallis statistic (H') = 4.013

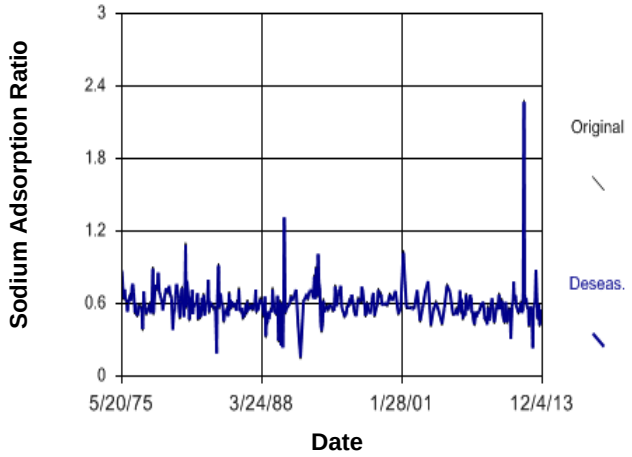


Figure D20 Beaver River: Sodium Adsorption Ratio

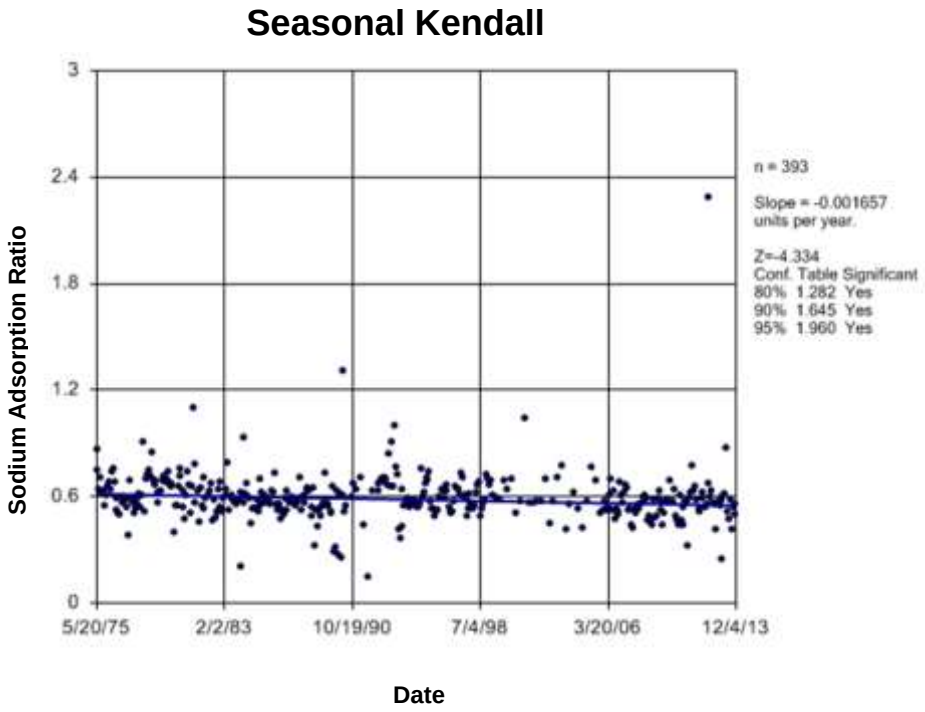


Figure D21 Beaver River: Sodium Adsorption Ratio

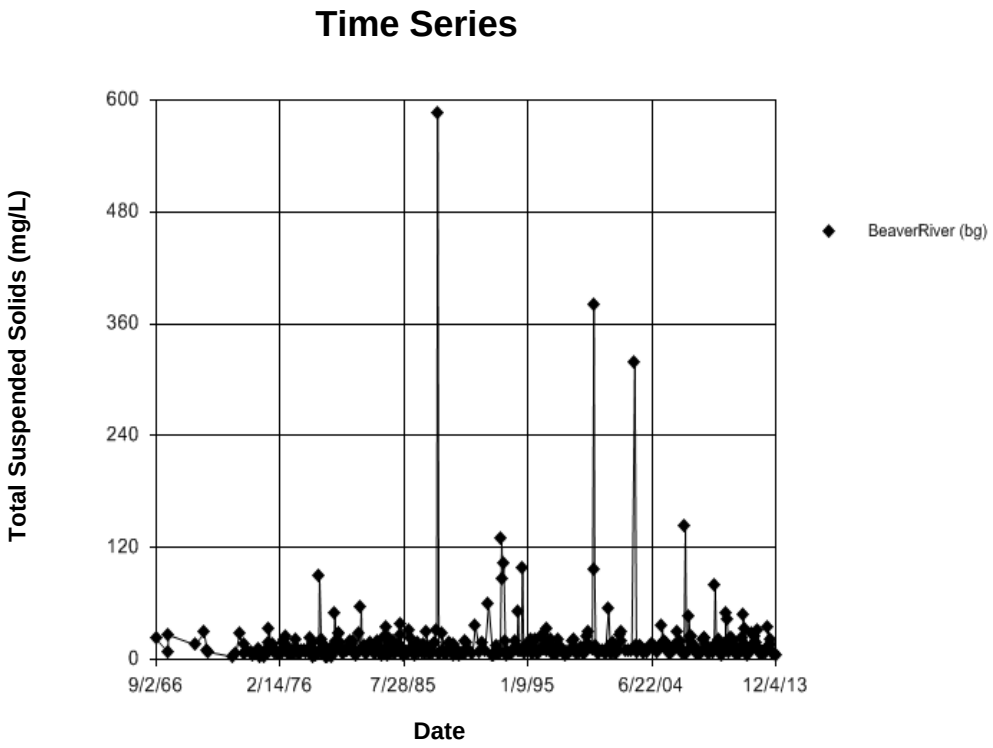


Figure D22 Beaver River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 8.127
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.127
Adjusted Kruskal-Wallis statistic (H') = 8.127

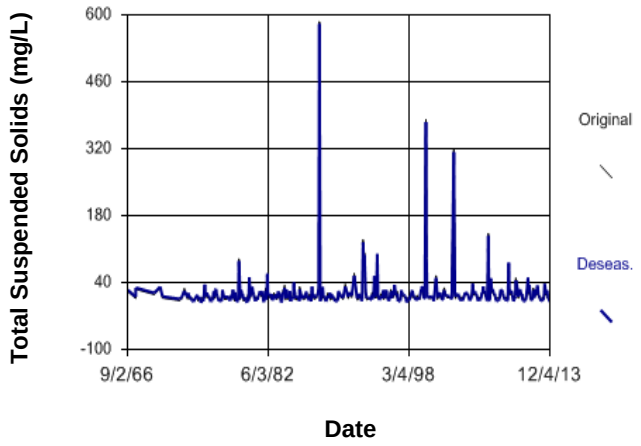


Figure D23 Beaver River: Total Suspended Solids

Seasonal Kendall

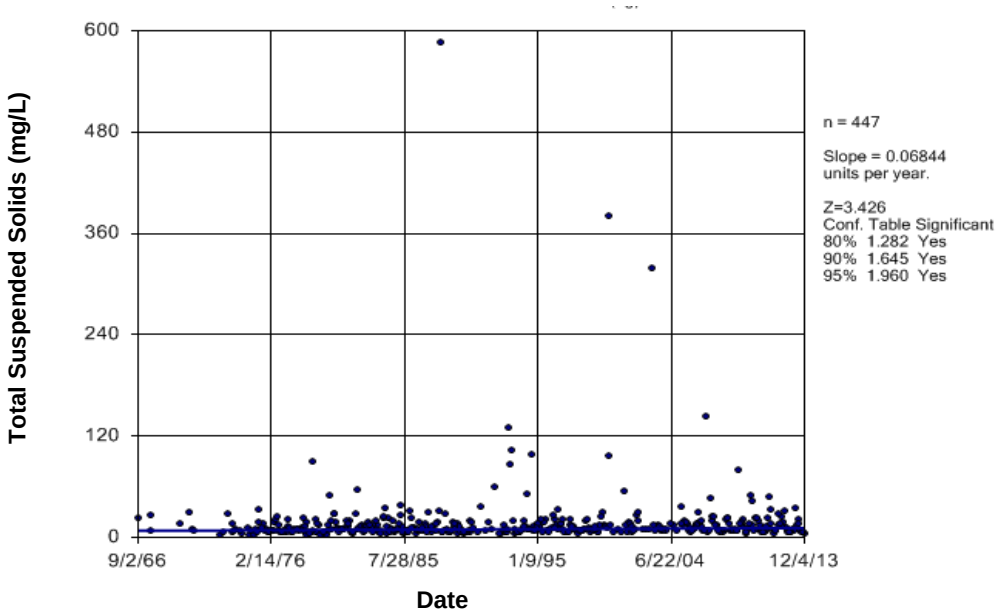


Figure D24 Beaver River: Total Suspended Solids

Time Series

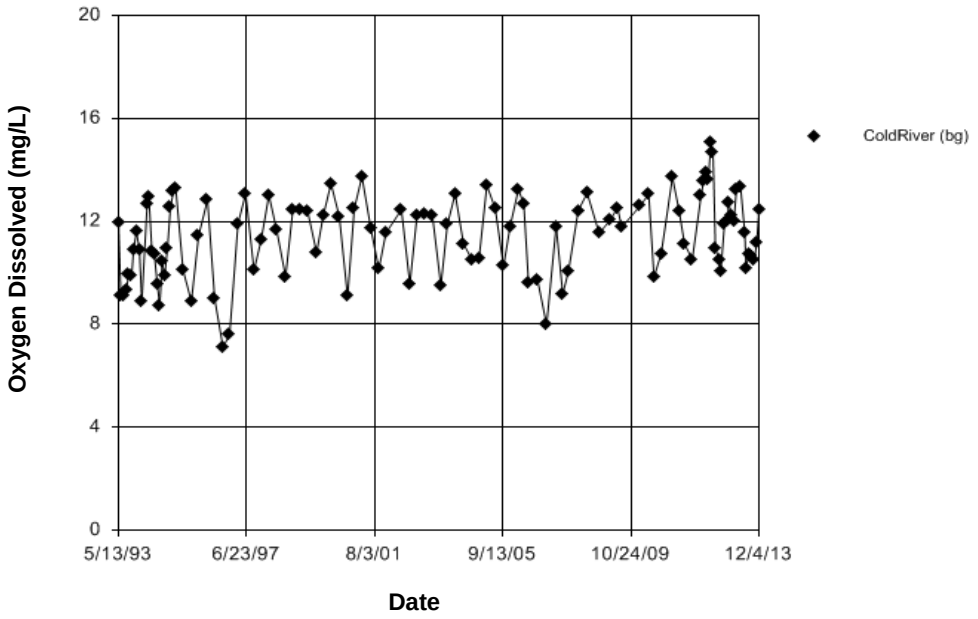


Figure D25 Cold River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 16.03
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 16.03
Adjusted Kruskal-Wallis statistic (H') = 16.03

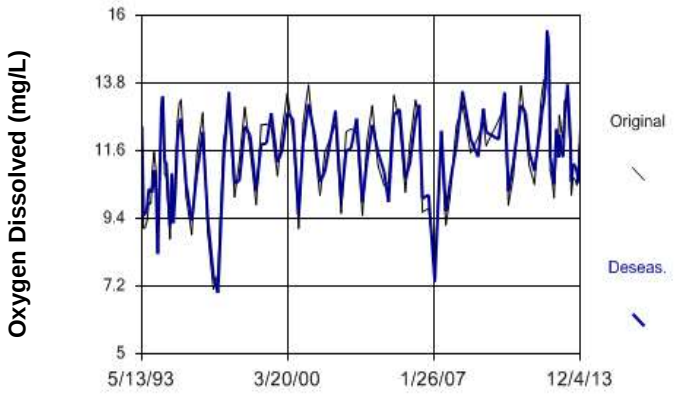


Figure D26 Cold River: Oxygen Dissolved

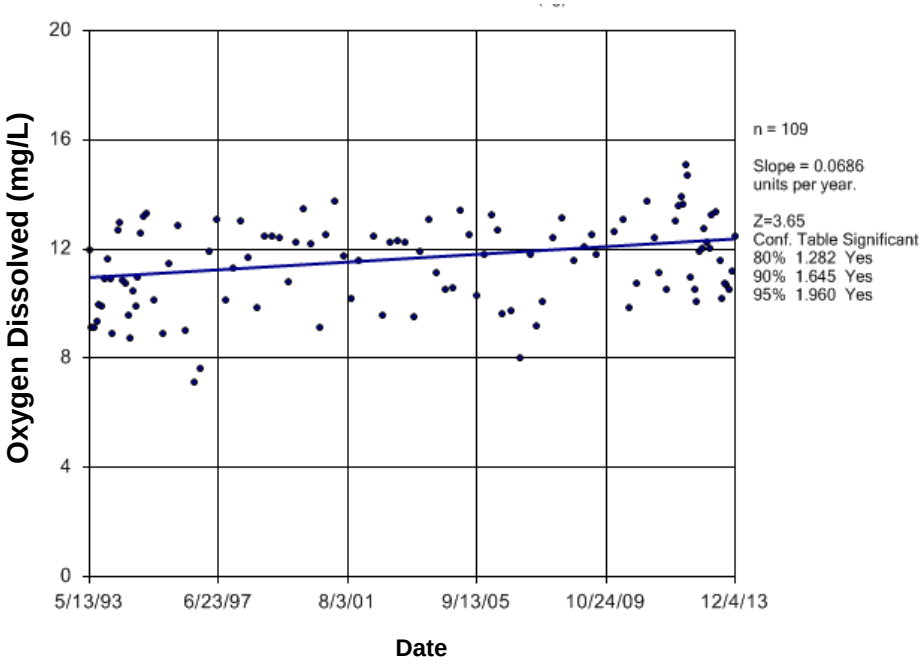


Figure D27 Cold River: Oxygen Dissolved

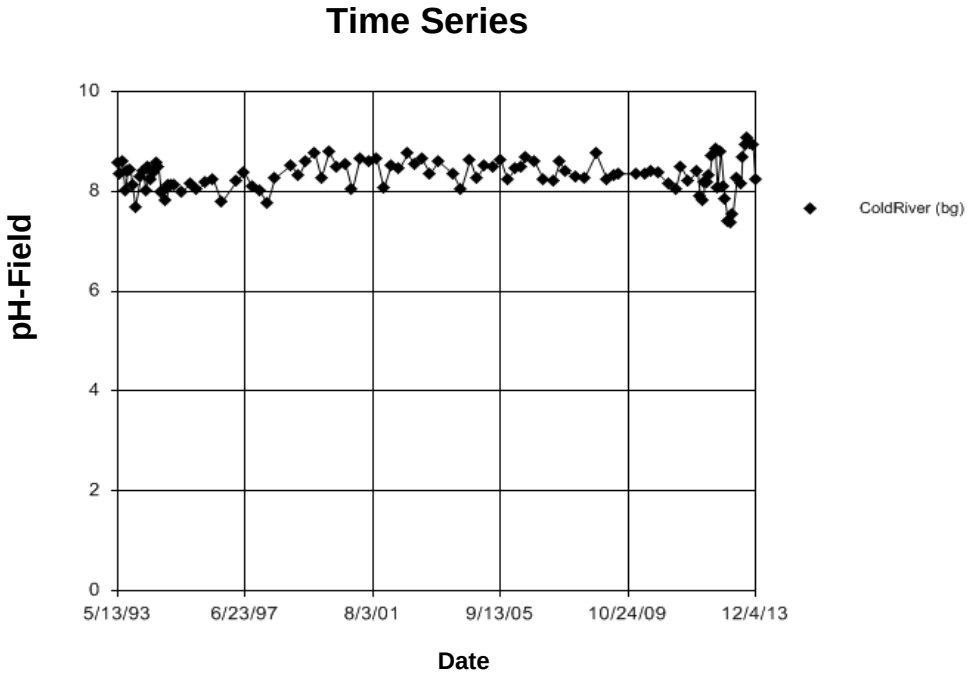


Figure D28 Cold River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 13.55
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 13.55
Adjusted Kruskal-Wallis statistic (H') = 13.55

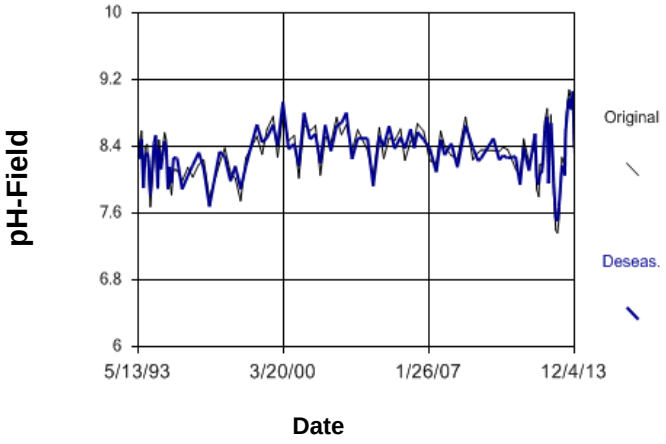


Figure D29 Cold River: pH-Field

Seasonal Kendall

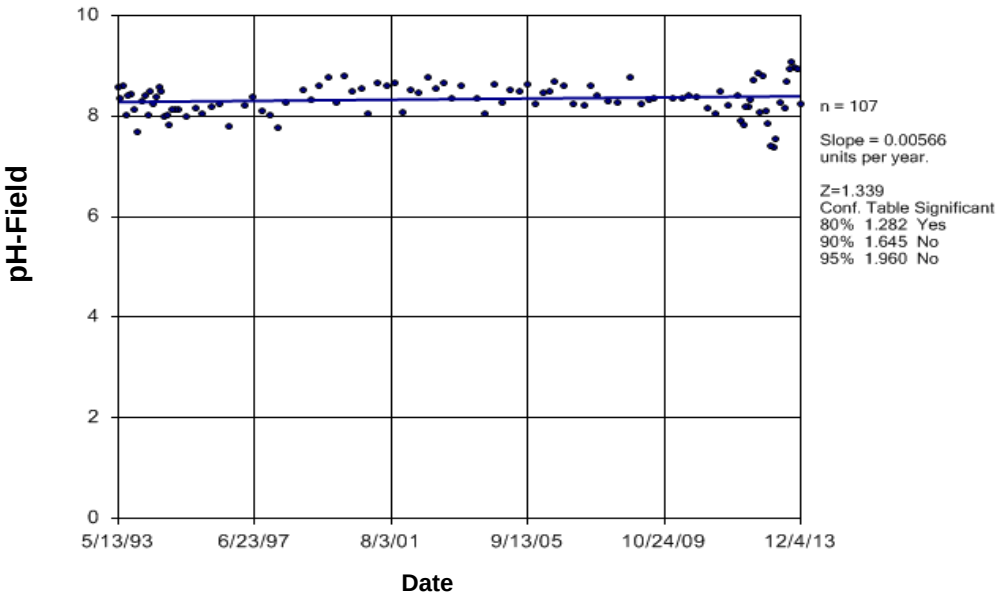


Figure D30 Cold River: pH-Field

Time Series

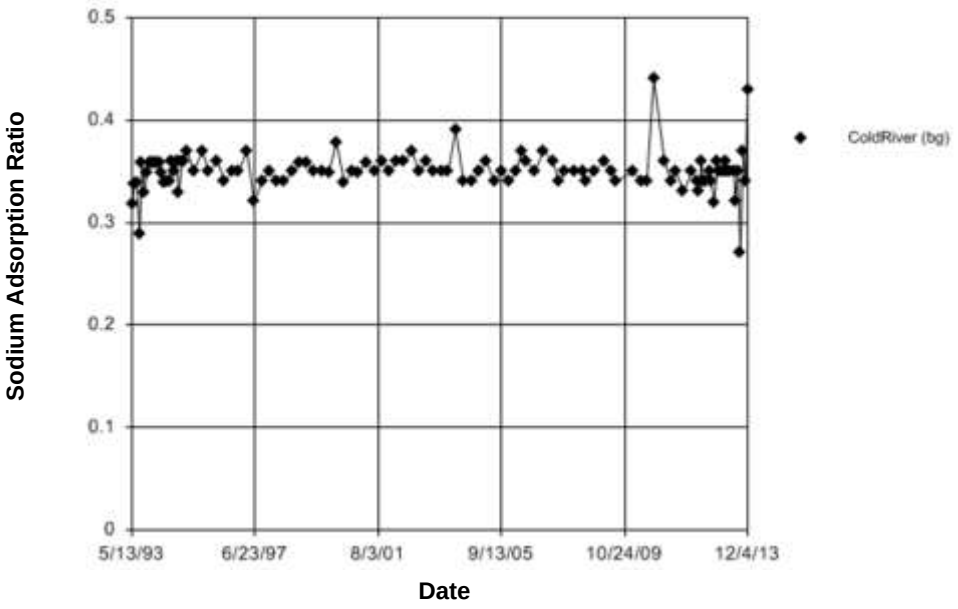


Figure D31 Cold River: Sodium Adsorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 12.31
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 21 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 12.3
Adjusted Kruskal-Wallis statistic (H') = 12.31

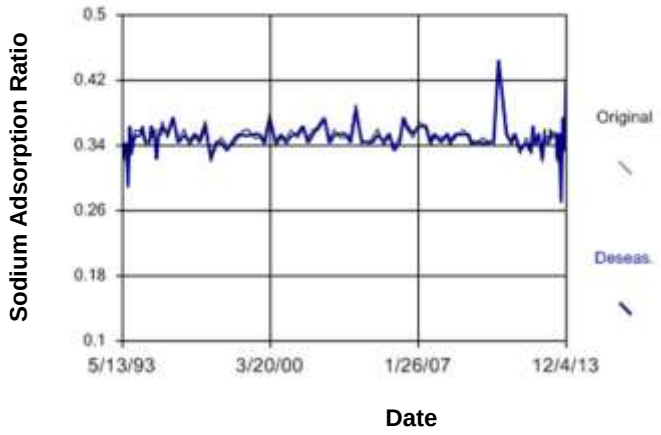


Figure D32 Cold River: Sodium Adsorption Ratio

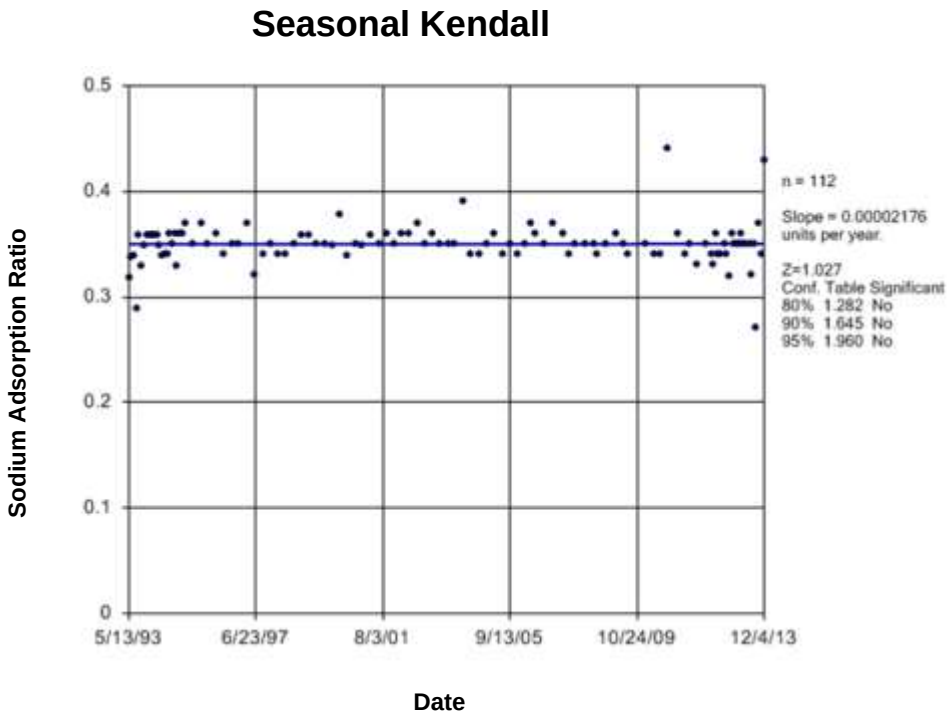


Figure D33 Cold River: Sodium Adsorption Ratio

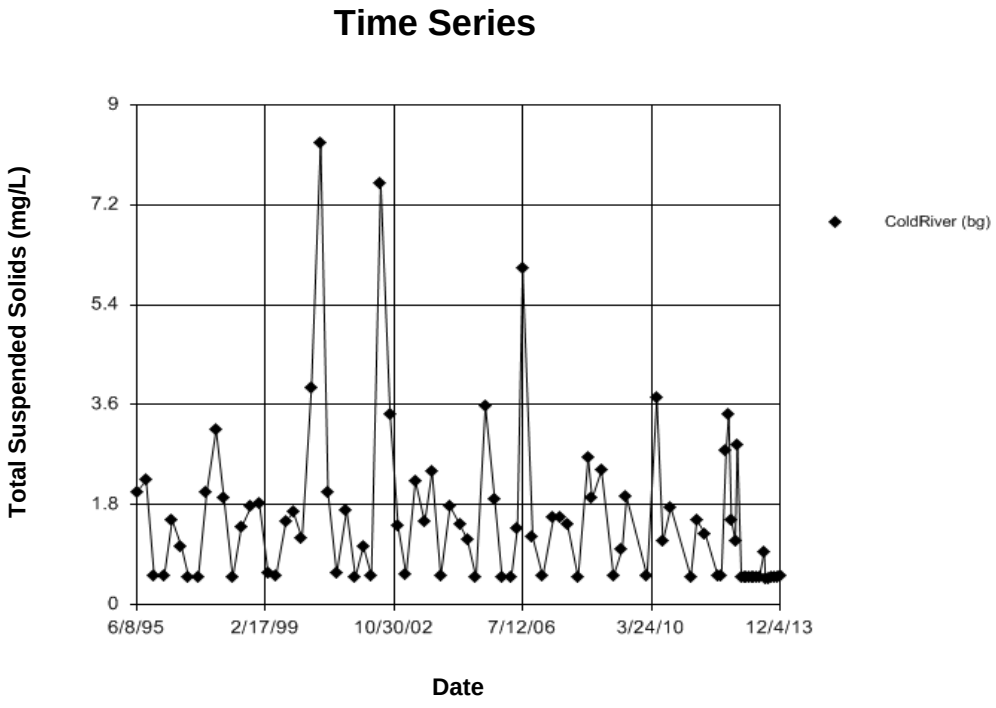


Figure D34 Cold River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 18.58
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 18.58
Adjusted Kruskal-Wallis statistic (H') = 18.58

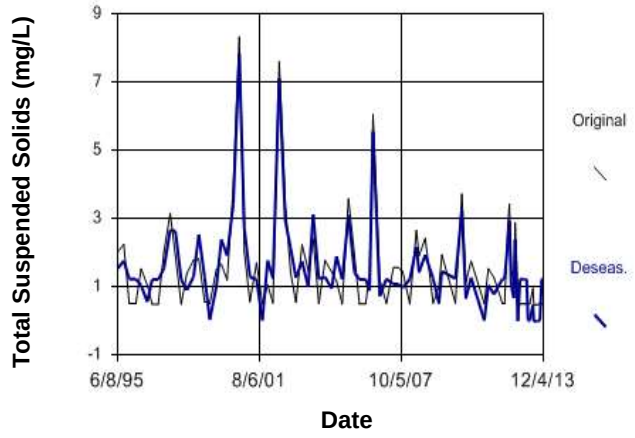


Figure D35 Cold River: Total Suspended Solids

Seasonal Kendall

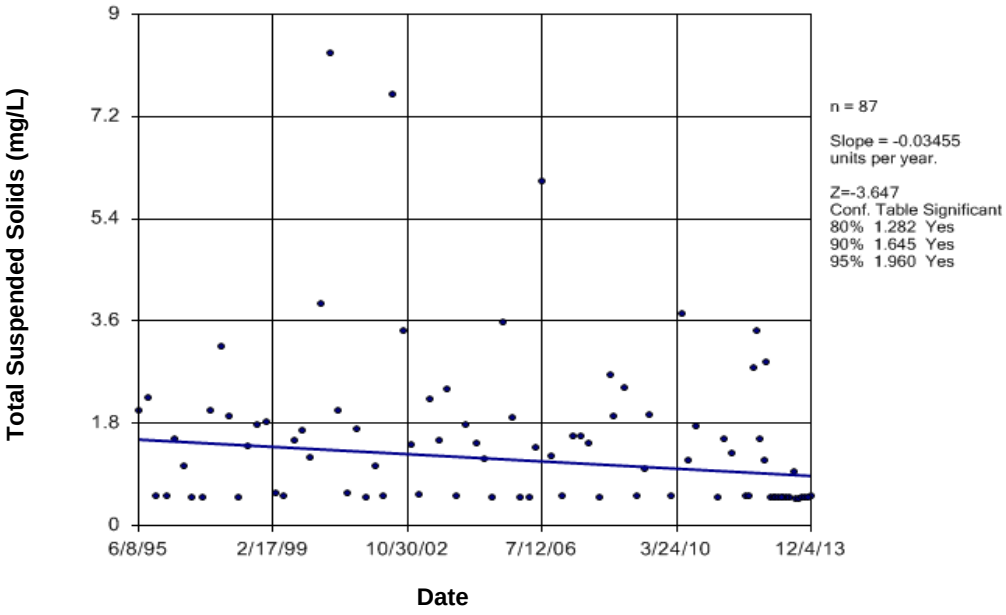


Figure D36 Cold River: Total Suspended Solids

Time Series

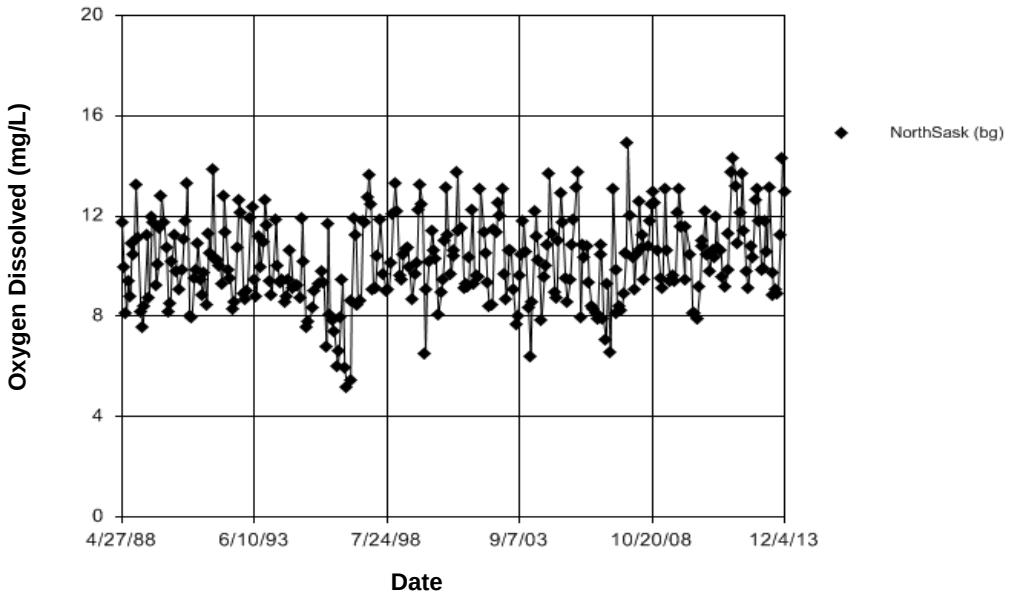


Figure D37 North Saskatchewan River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.125
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 26 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.125
Adjusted Kruskal-Wallis statistic (H') = 2.125

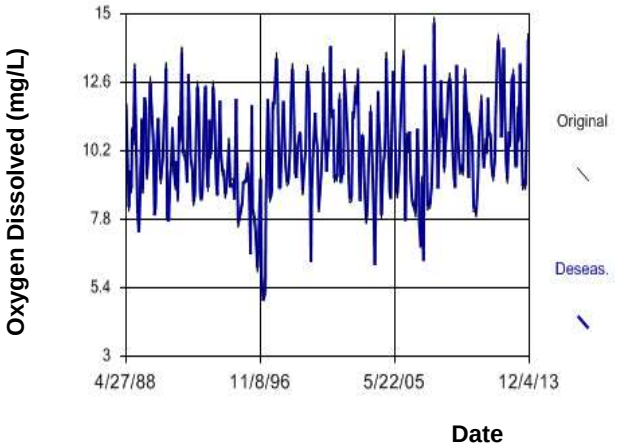


Figure D38 North Saskatchewan River: Oxygen Dissolved

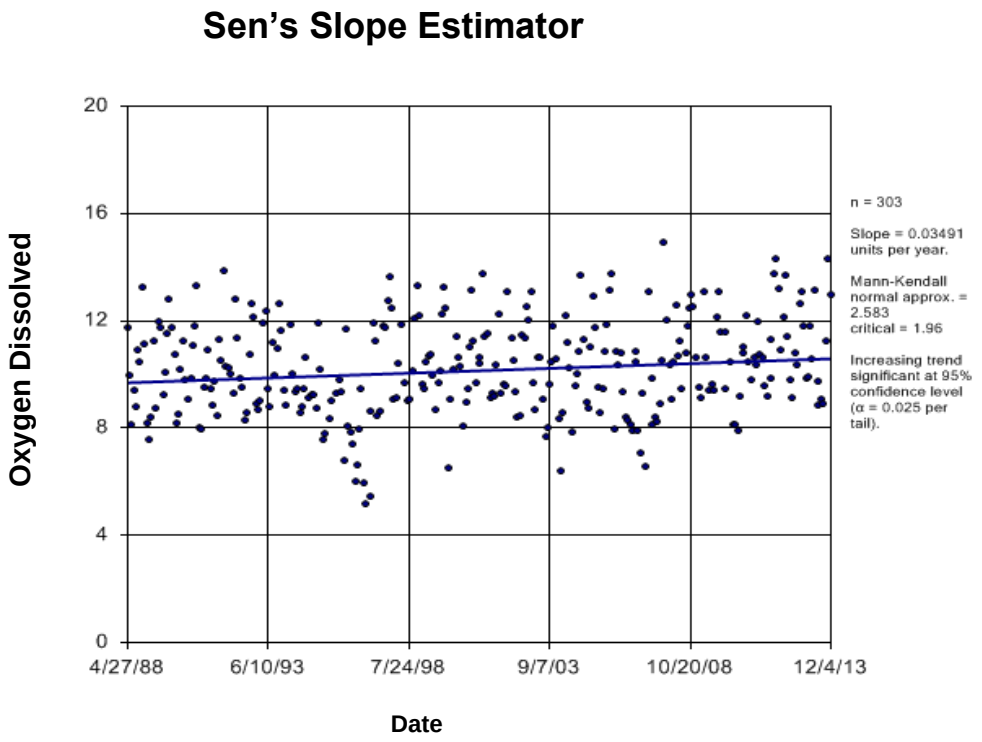


Figure D39 North Saskatchewan River: Oxygen Dissolved

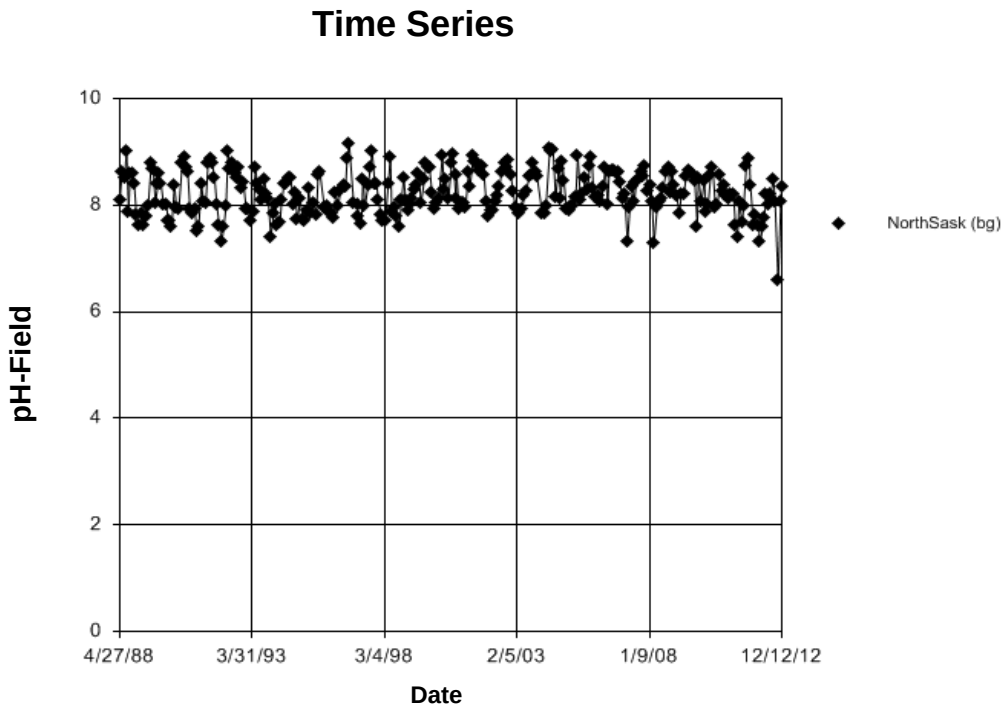


Figure D40 North Saskatchewan River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 51.68
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 26 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 51.67
Adjusted Kruskal-Wallis statistic (H') = 51.68

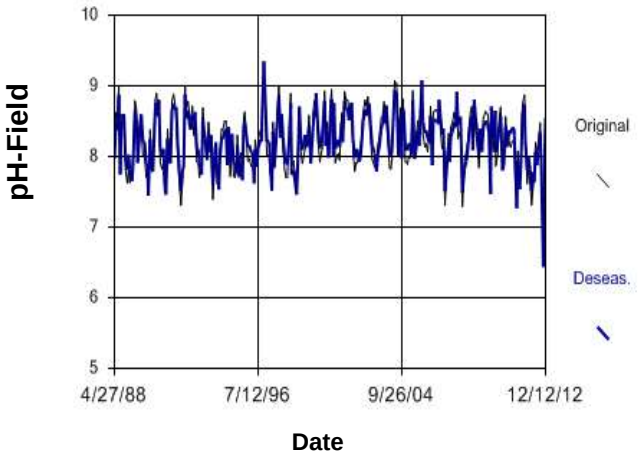


Figure D41 North Saskatchewan River: pH-Field

Seasonal Kendall

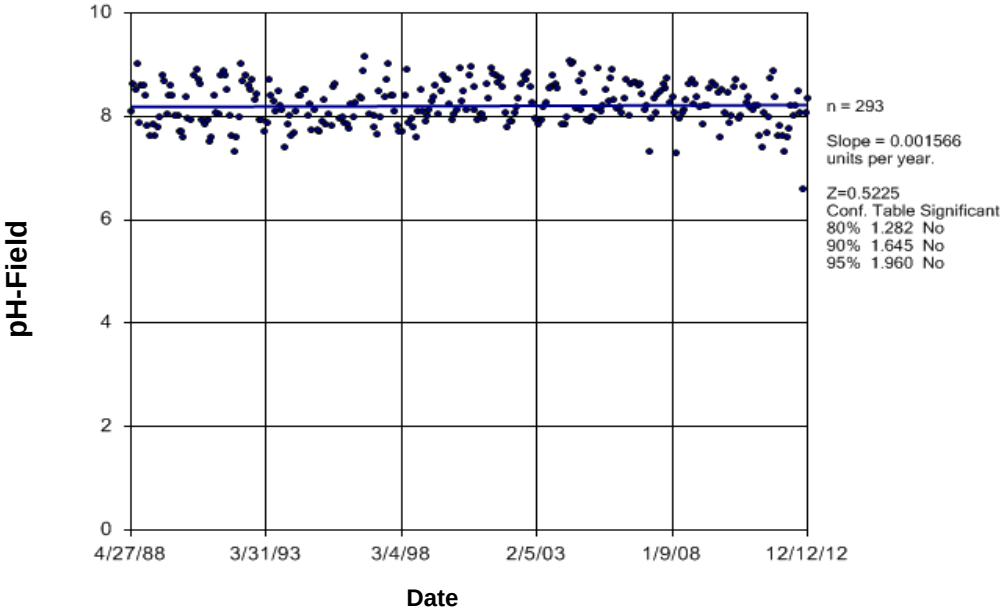


Figure D42 North Saskatchewan River: pH-Field

Time Series

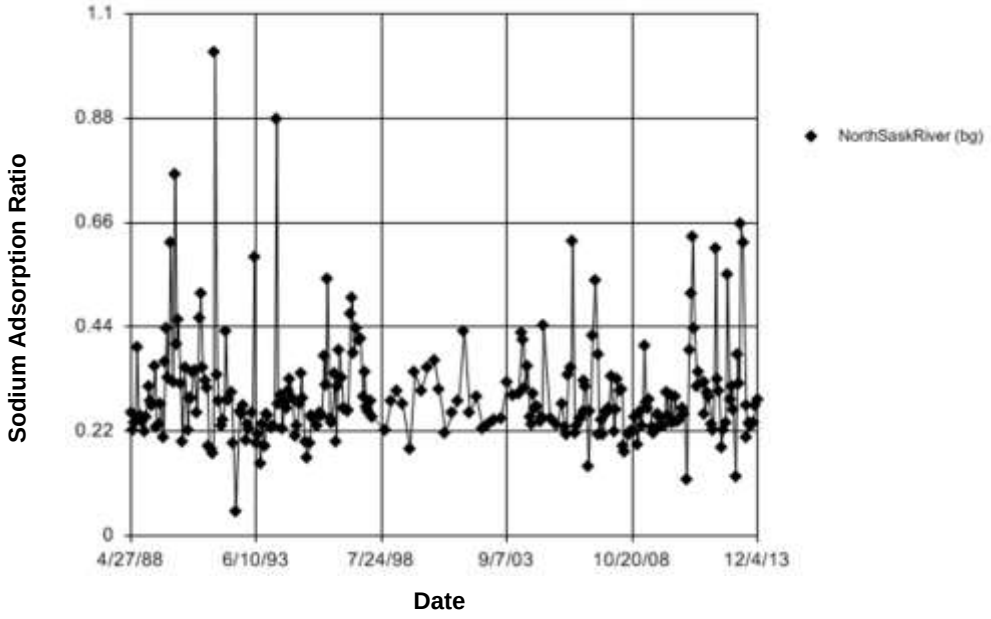


Figure D43 North Saskatchewan River: Sodium Adsorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.4005
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.4005
Adjusted Kruskal-Wallis statistic (H') = 0.4005

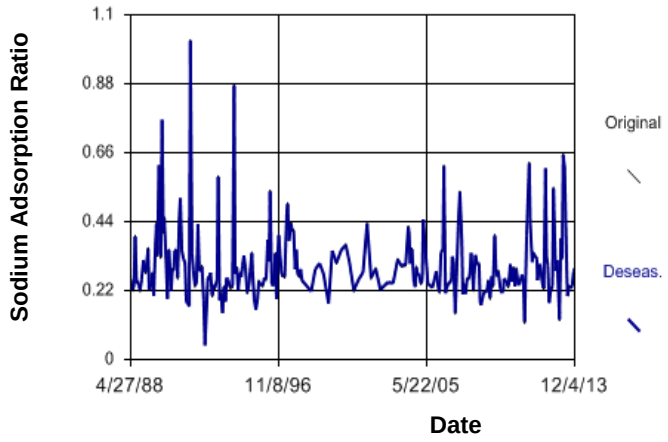


Figure D44 North Saskatchewan River: Sodium Adsorption Ratio

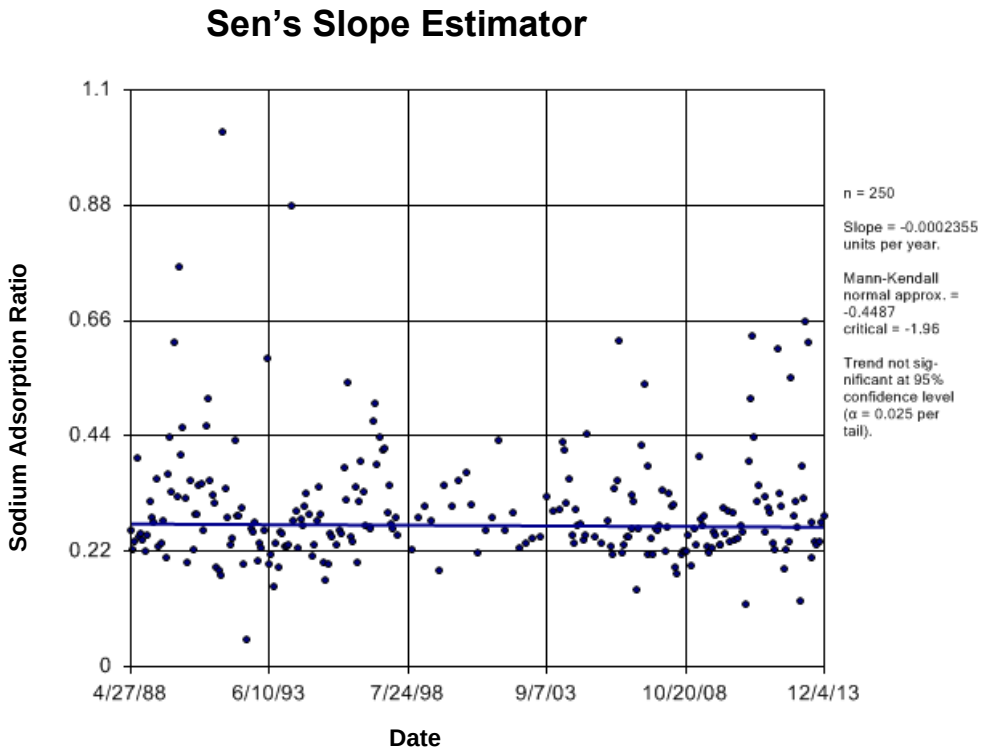


Figure D45 North Saskatchewan River: Sodium Adsorption Ratio

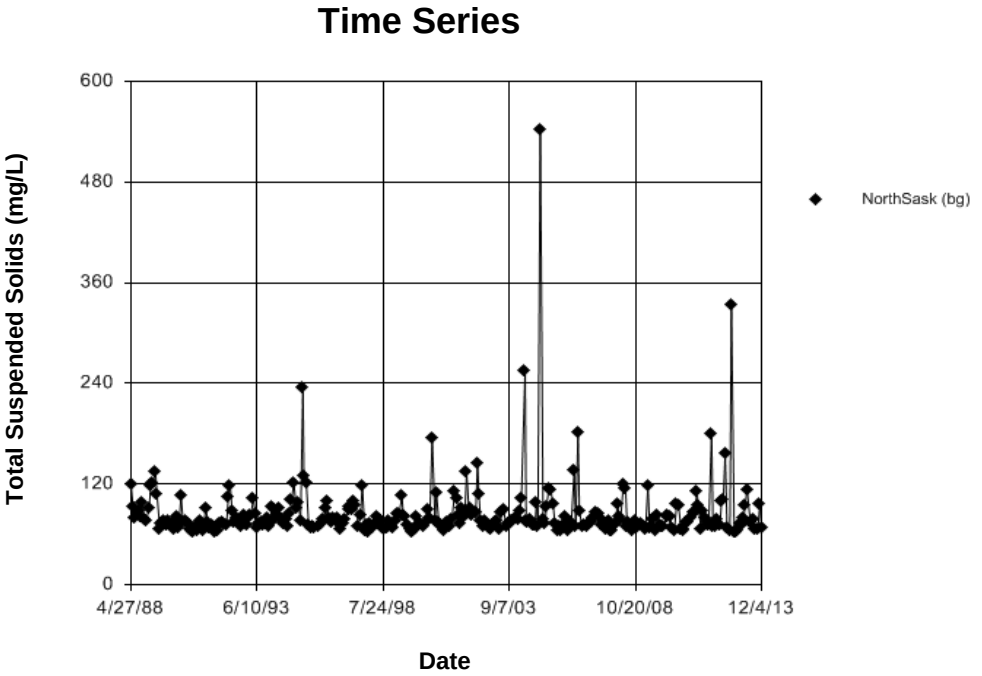


Figure D46 North Saskatchewan River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.228
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.228
Adjusted Kruskal-Wallis statistic (H') = 1.228

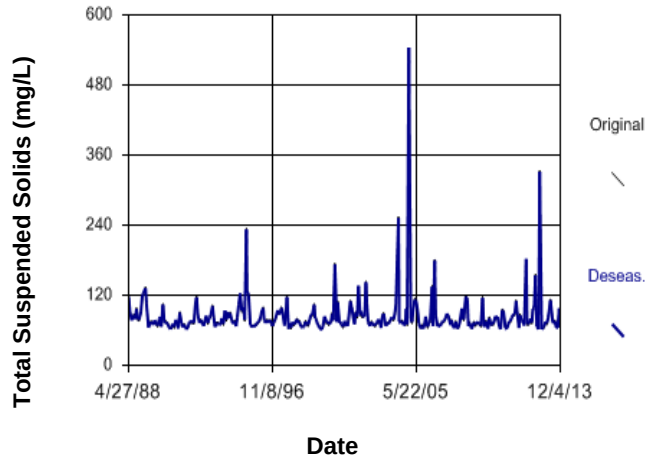


Figure D47 North Saskatchewan River: Total Suspended Solids

Sen's Slope Estimator

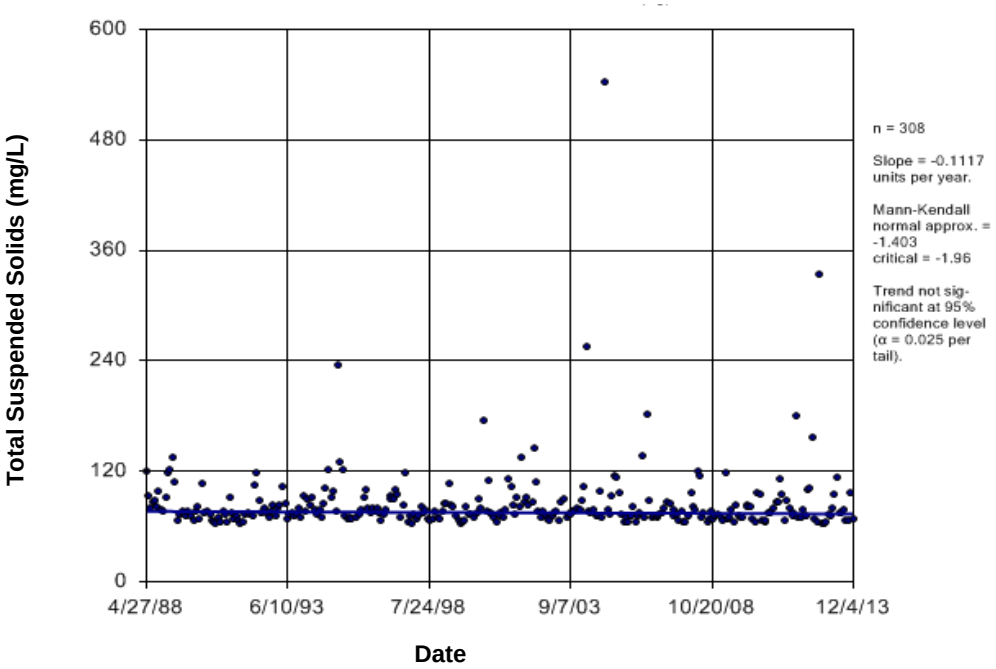


Figure D48 North Saskatchewan River: Total Suspended Solids

Time Series

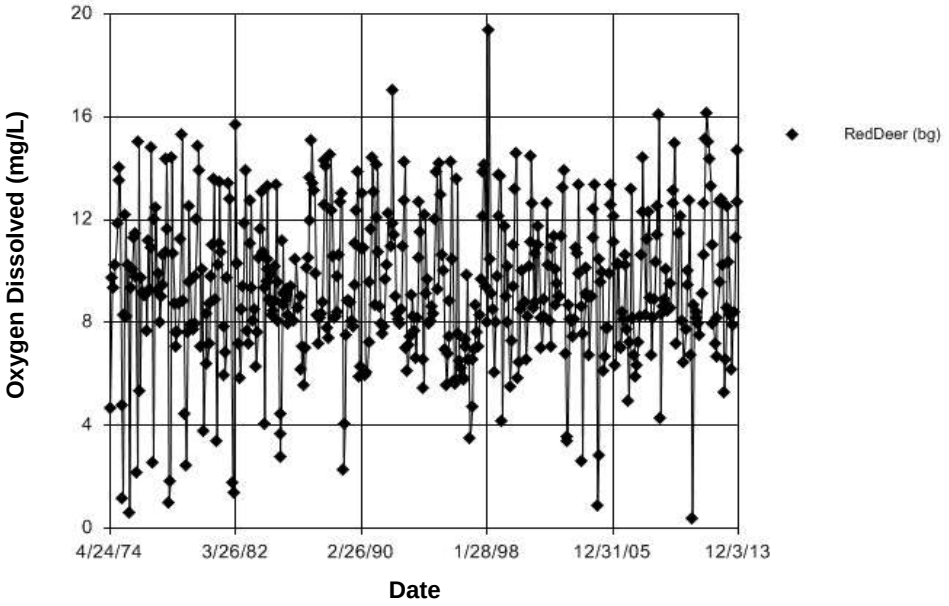


Figure D49 Red Deer River (AB-SK): Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 17.11
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 36 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 17.11
Adjusted Kruskal-Wallis statistic (H') = 17.11

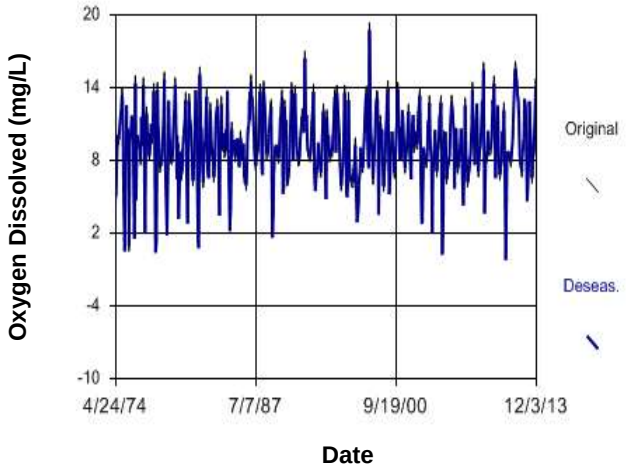


Figure D50 Red Deer River (AB-SK): Oxygen Dissolved

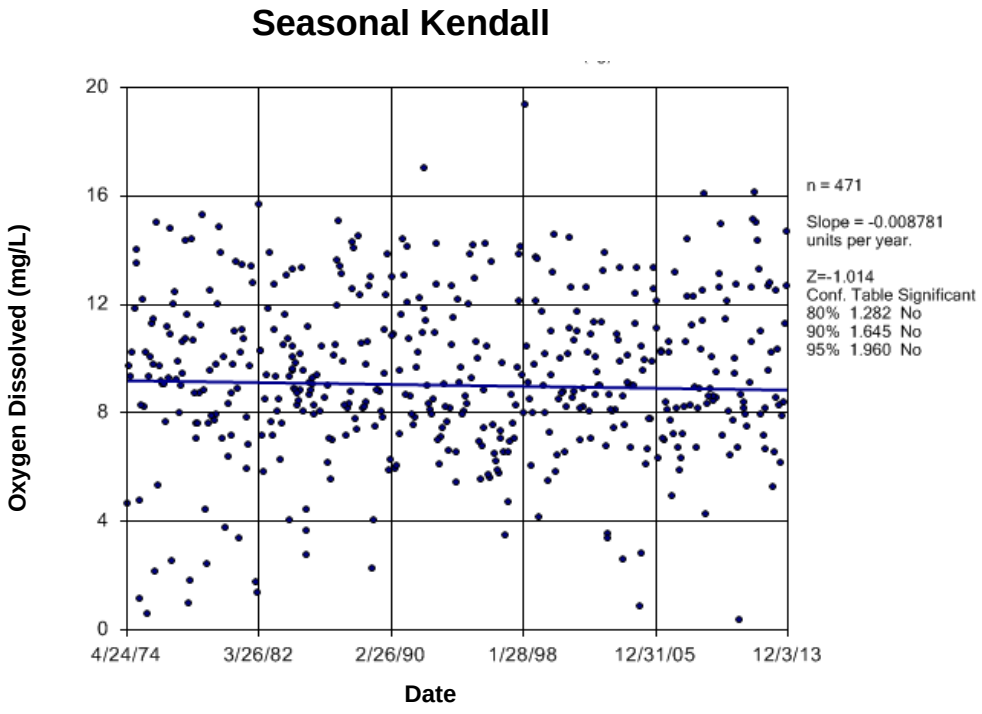


Figure D51 Red Deer River (AB-SK): Oxygen Dissolved

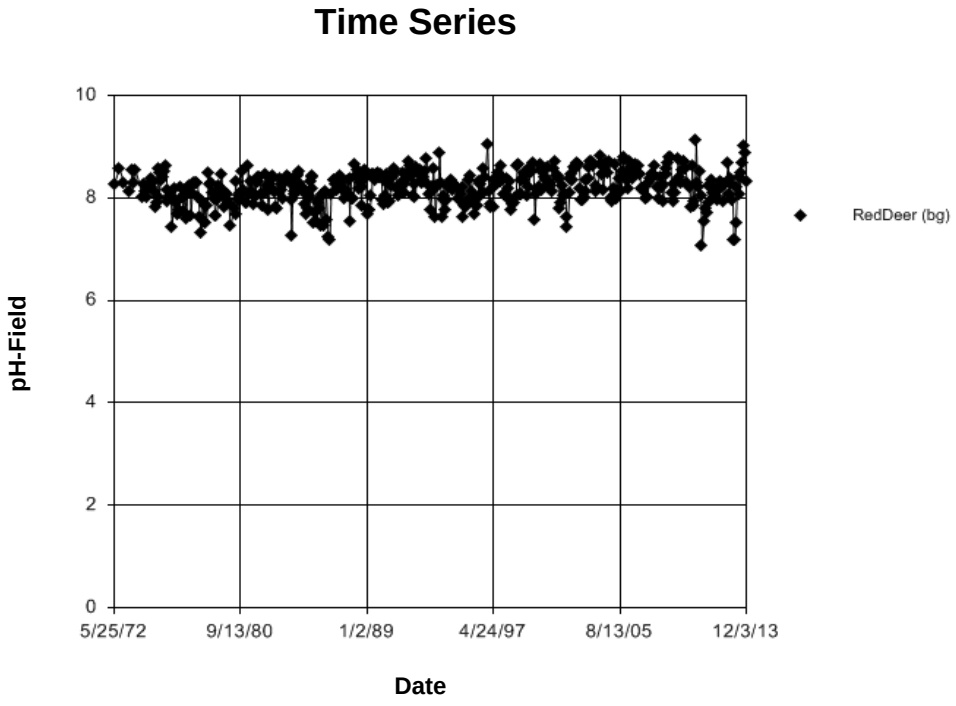


Figure D52 Red Deer River (AB-SK): pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 16.39
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 79 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 16.39
Adjusted Kruskal-Wallis statistic (H') = 16.39

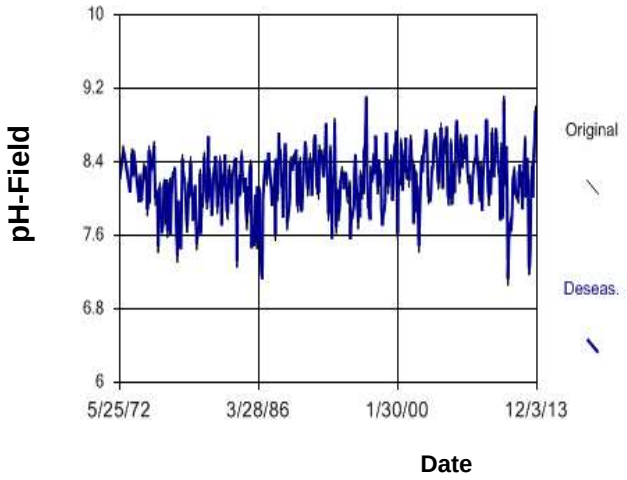


Figure D53 Red Deer River (AB-SK): pH-Field

Seasonal Kendall

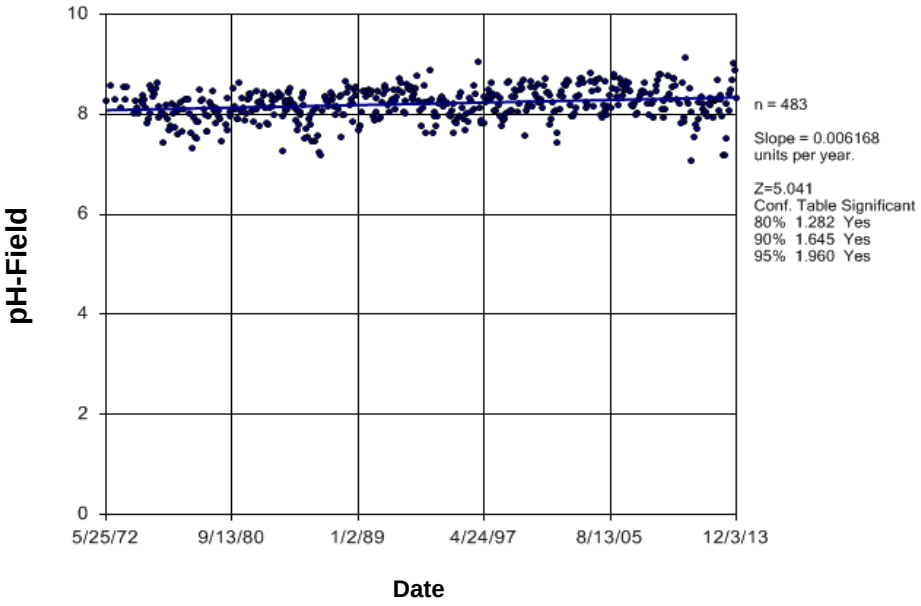


Figure D54 Red Deer River (AB-SK): pH-Field

Time Series

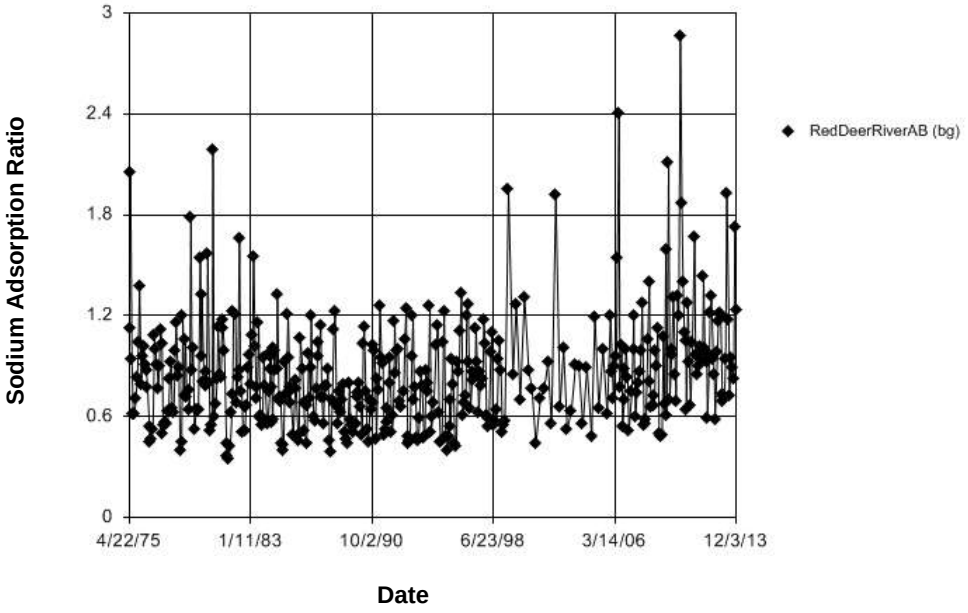


Figure D55 Red Deer River (AB-SK): Sodium Adsorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.0004001
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.0004001
Adjusted Kruskal-Wallis statistic (H') = 0.0004001

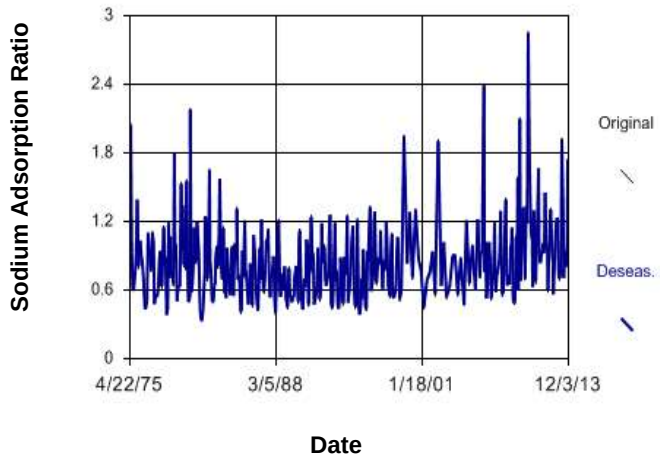


Figure D56 Red Deer River (AB-SK): Sodium Adsorption Ratio

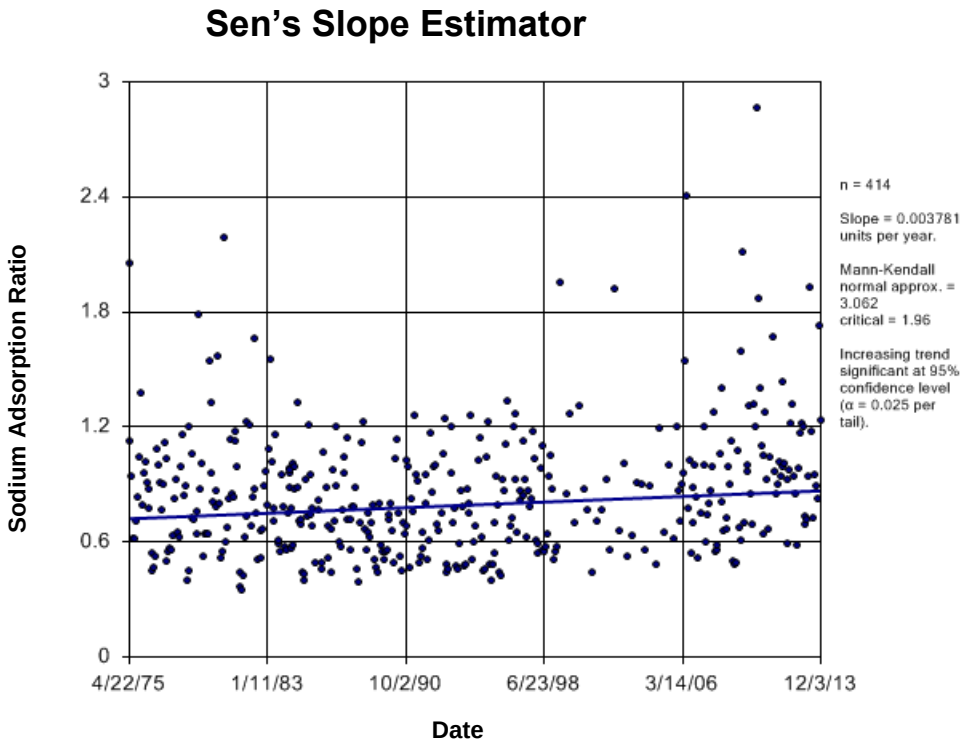


Figure D57 Red Deer River (AB-SK): Sodium Adsorption Ratio

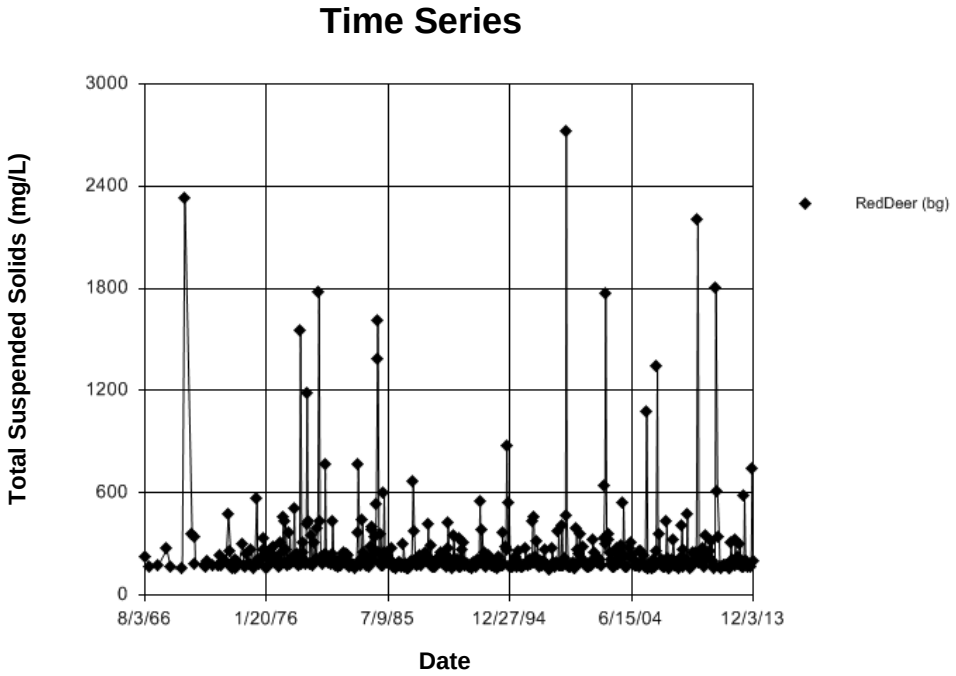


Figure D58 Red Deer River (AB-SK): Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 21.63
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 62 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 21.63
Adjusted Kruskal-Wallis statistic (H') = 21.63

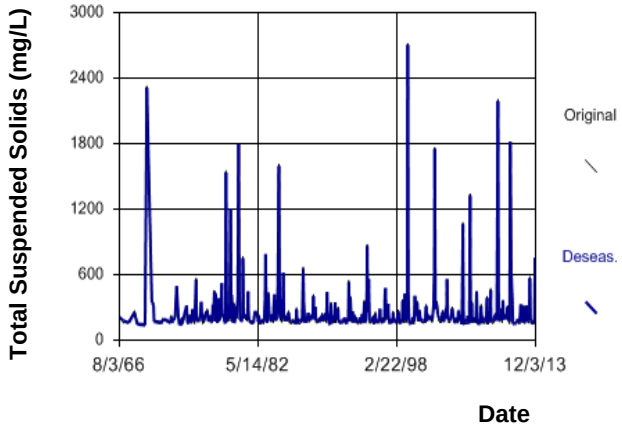


Figure D59 Red Deer River (AB-SK): Total Suspended Solids

Seasonal Kendall

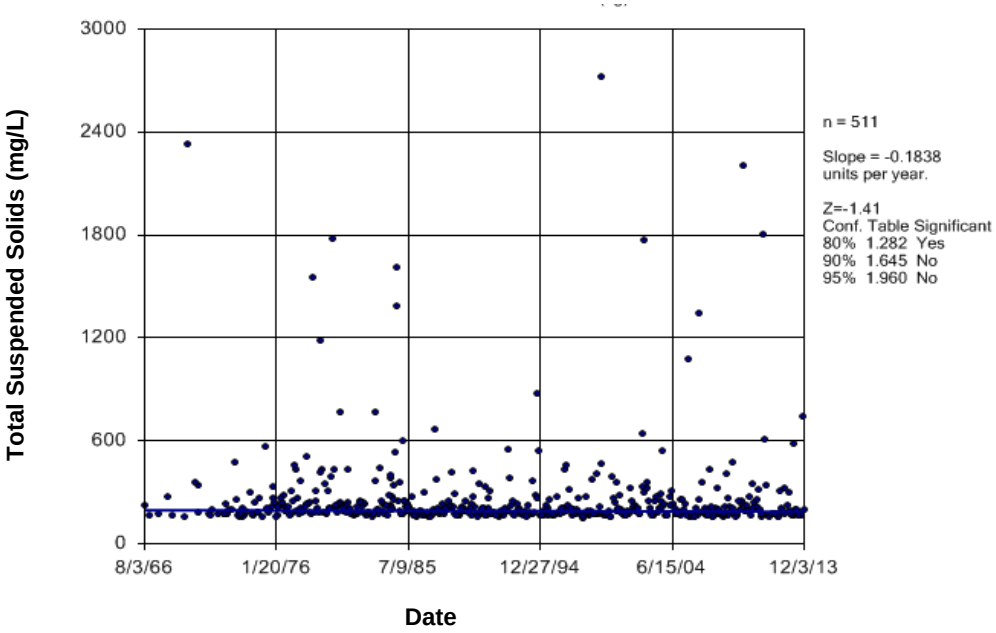


Figure D60 Red Deer River (AB-SK): Total Suspended Solids

Time Series

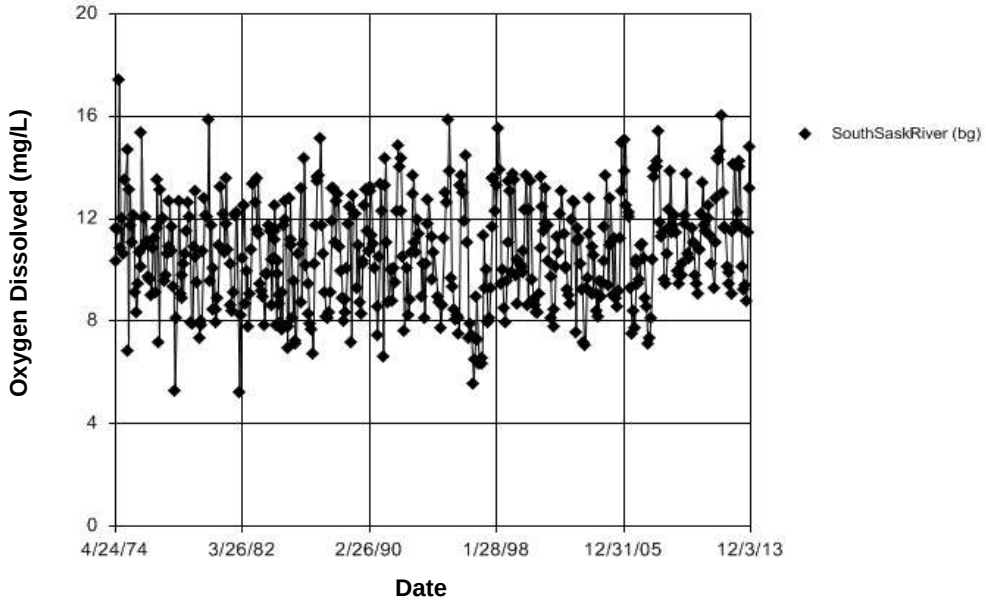


Figure D61 South Saskatchewan River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 128.3
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 65 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 128.3
Adjusted Kruskal-Wallis statistic (H') = 128.3

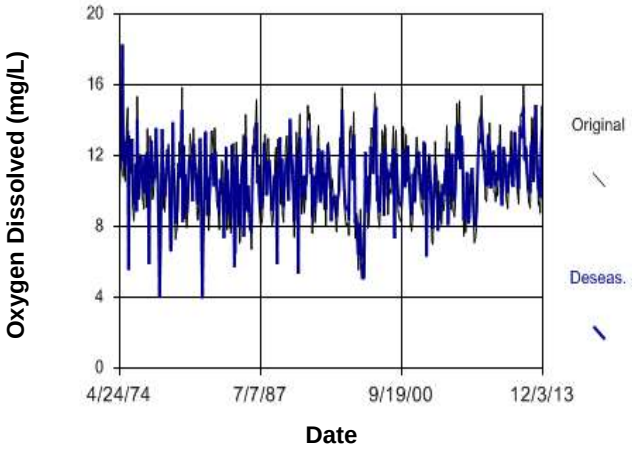


Figure D62 South Saskatchewan River: Oxygen Dissolved

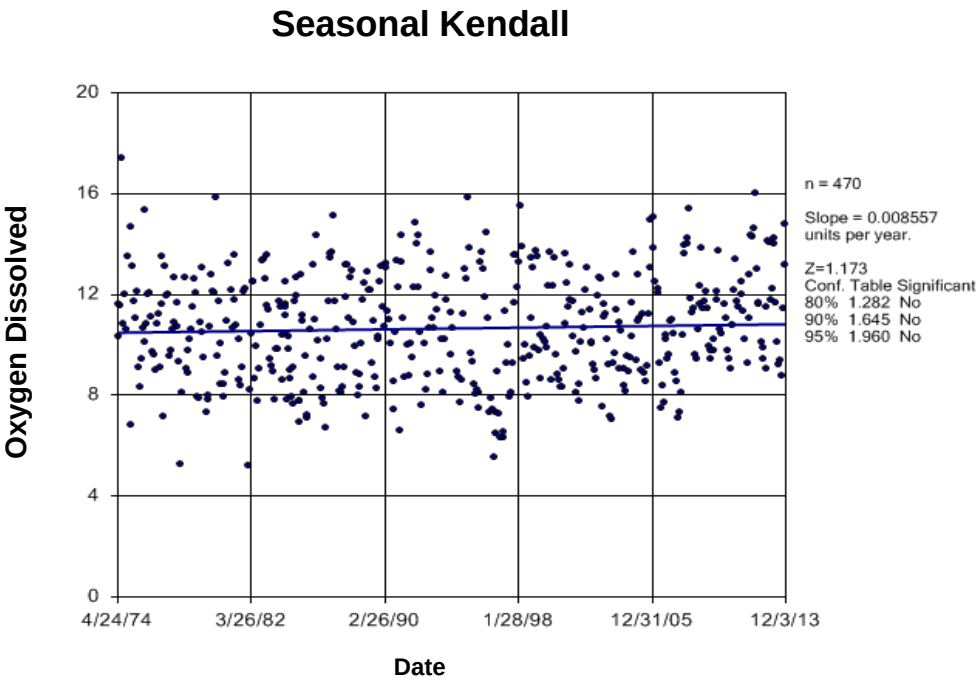


Figure D63 South Saskatchewan River: Oxygen Dissolved

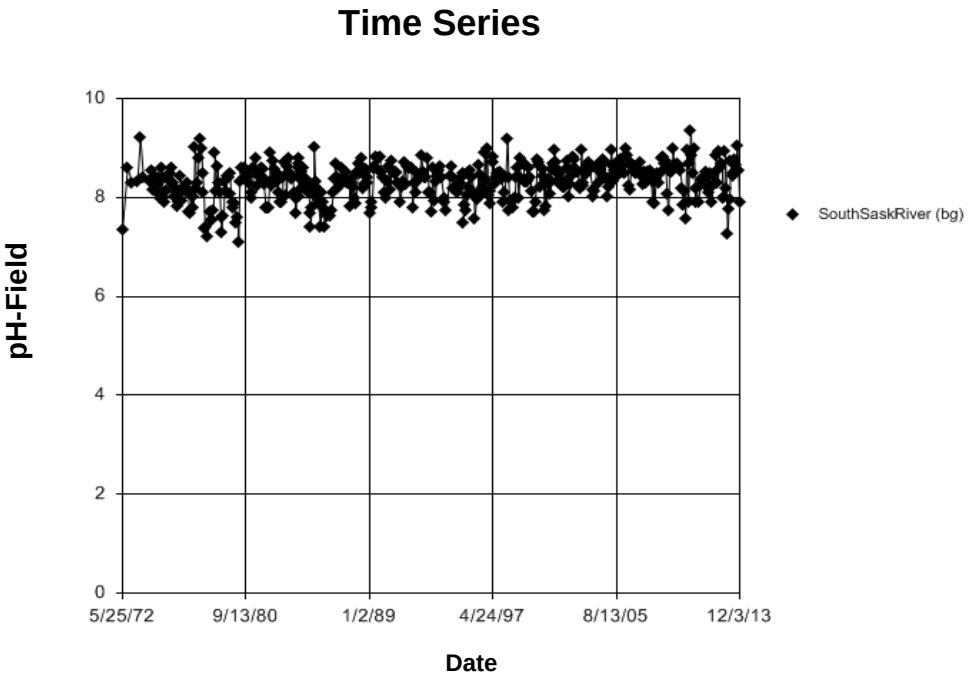


Figure D64 South Saskatchewan River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 72.81
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 72 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 72.81
Adjusted Kruskal-Wallis statistic (H') = 72.81

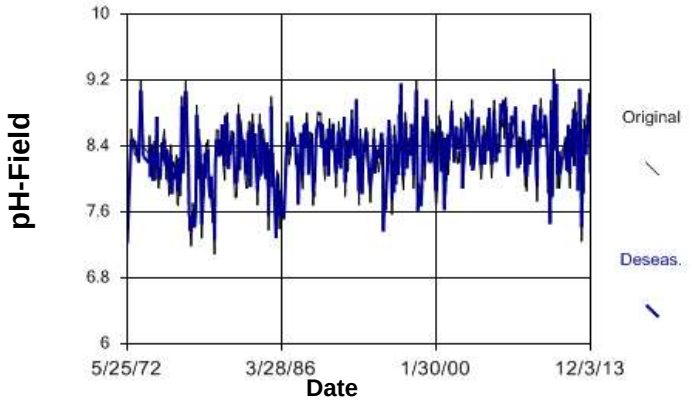


Figure D65 South Saskatchewan River: pH-Field

Seasonal Kendall

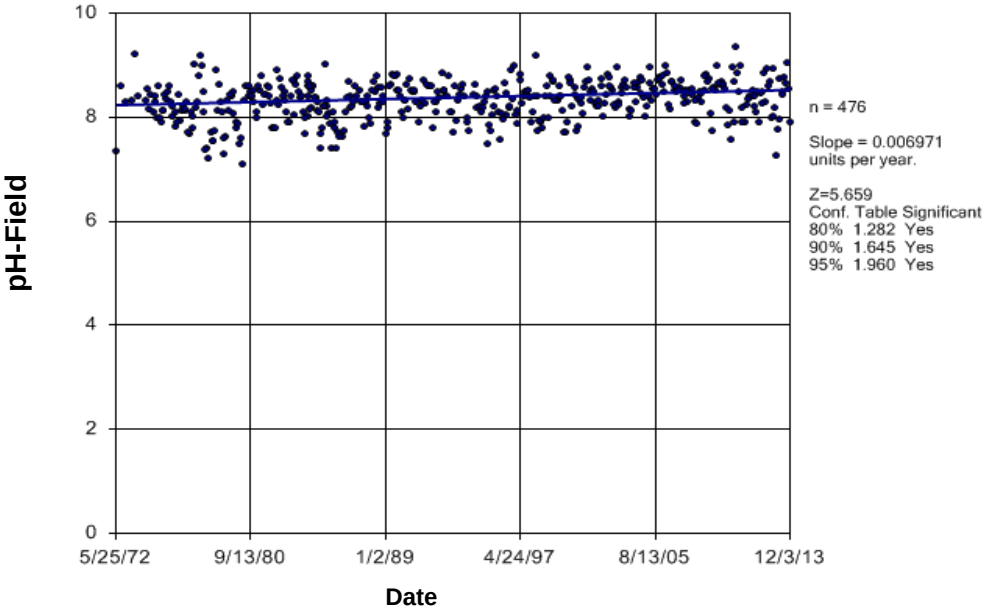


Figure D66 South Saskatchewan River: pH-Field

Time Series

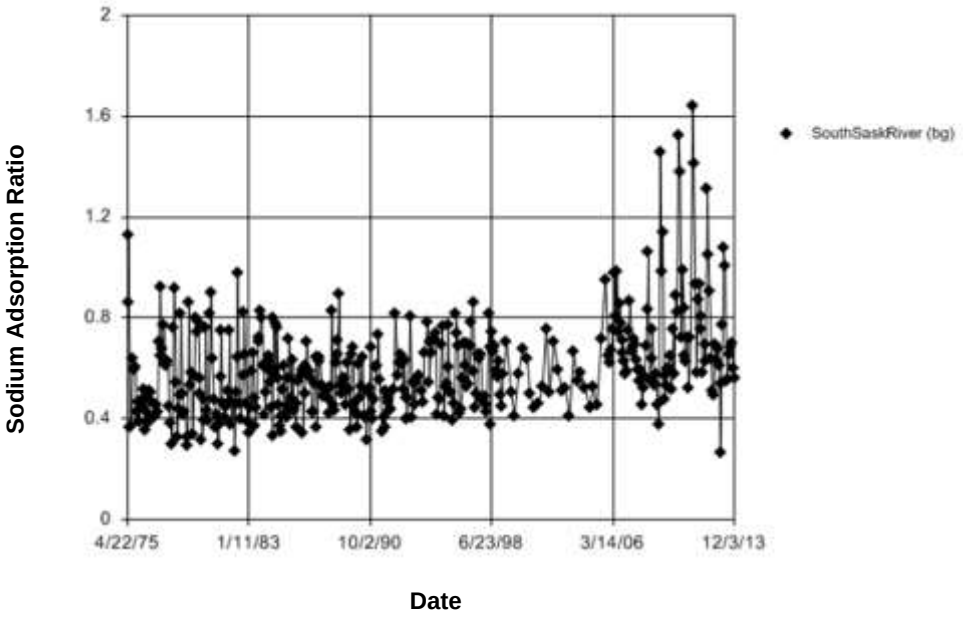


Figure D67 South Saskatchewan River: Sodium Adsorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 42.65
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 14 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 42.65
Adjusted Kruskal-Wallis statistic (H') = 42.65

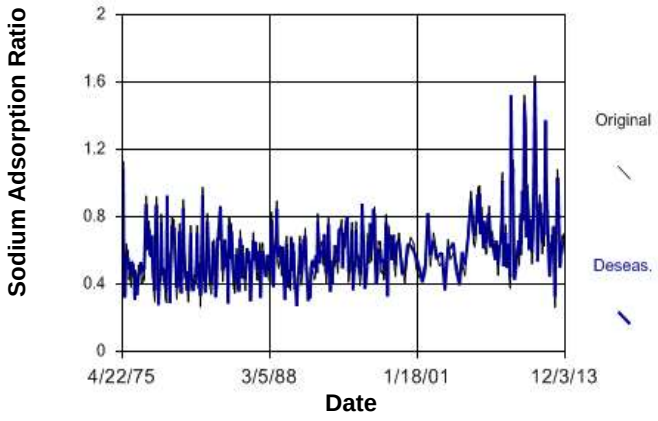


Figure D68 South Saskatchewan River: Sodium Adsorption Ratio

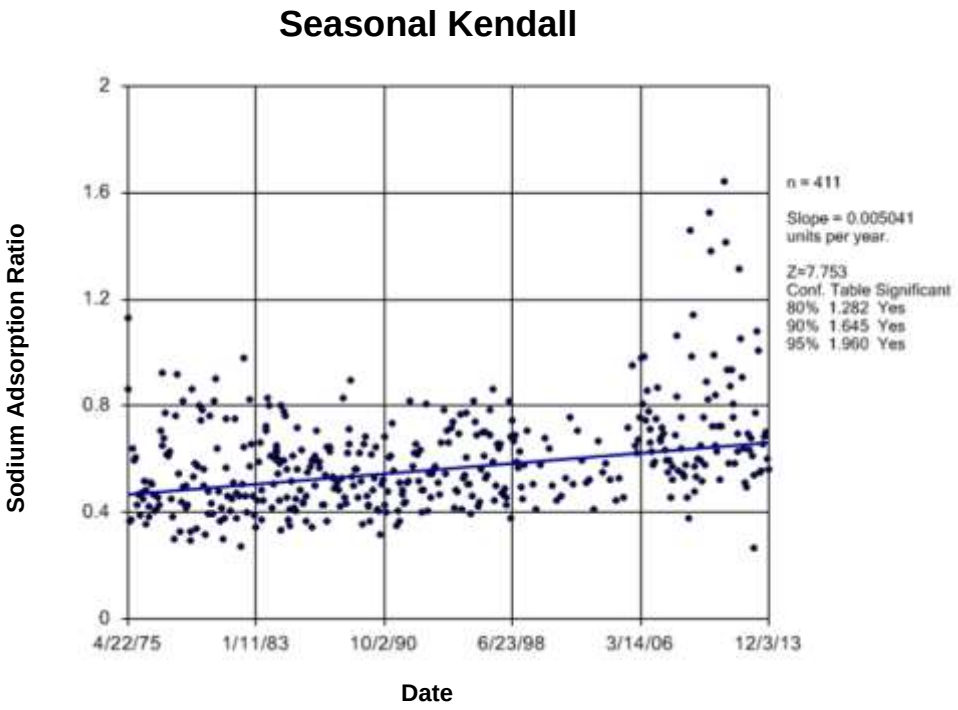


Figure D69 South Saskatchewan River: Sodium Adsorption Ratio

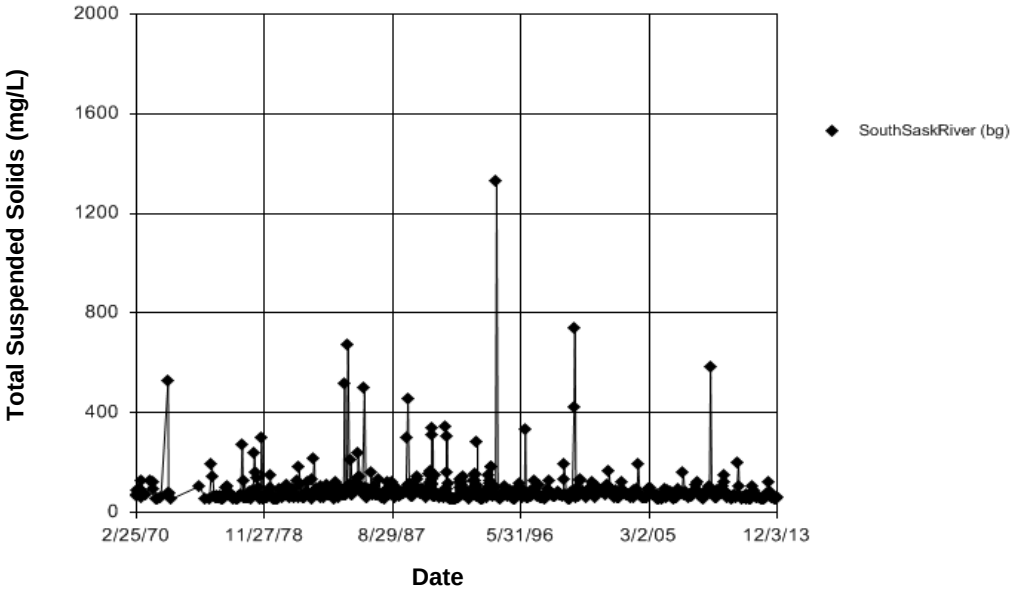


Figure D70 South Saskatchewan River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 53.38
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 31 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 53.38
Adjusted Kruskal-Wallis statistic (H') = 53.38

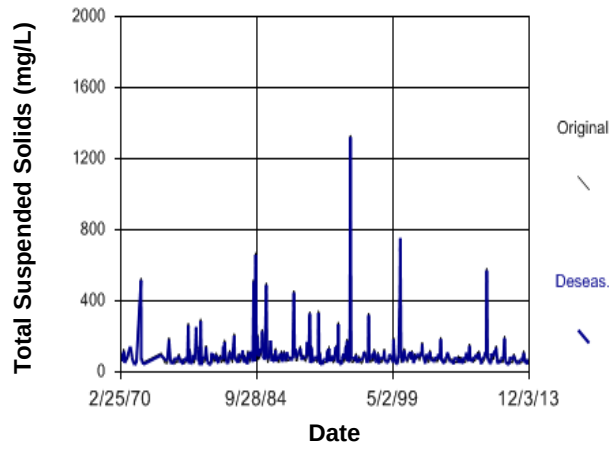


Figure D71 South Saskatchewan River: Total Suspended Solids

Seasonal Kendall

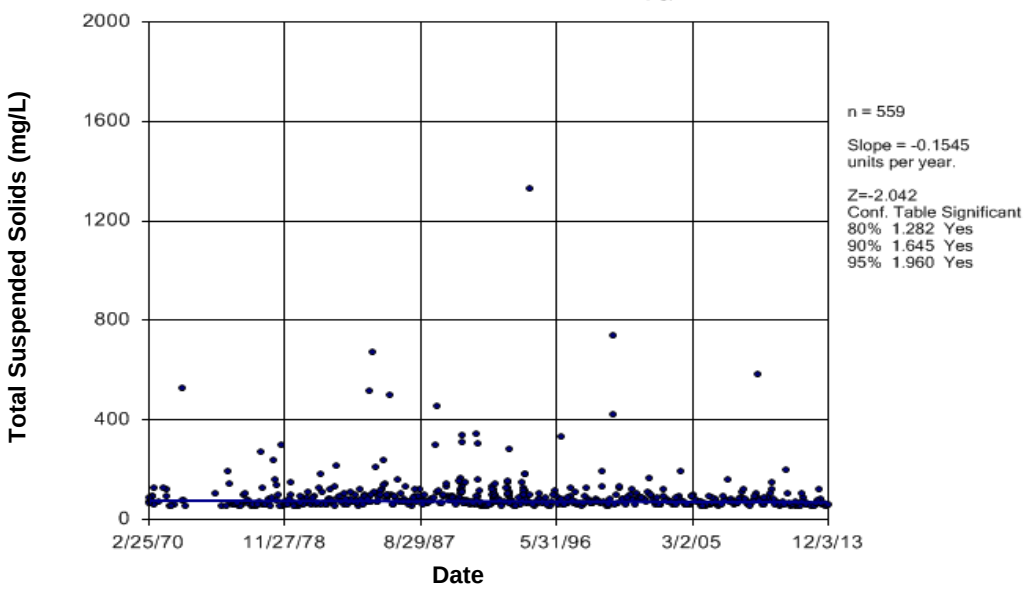


Figure D72 South Saskatchewan River: Total Suspended Solids

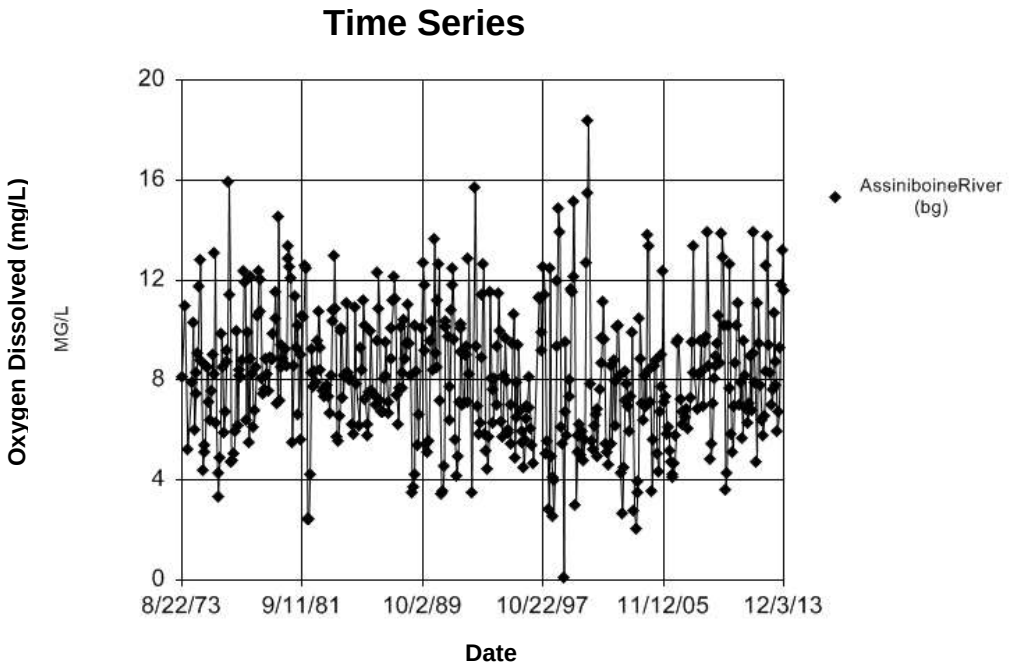


Figure D73 Assiniboine River: Oxygen Dissolved

Seasonality

For the selected data, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 13.96
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H')

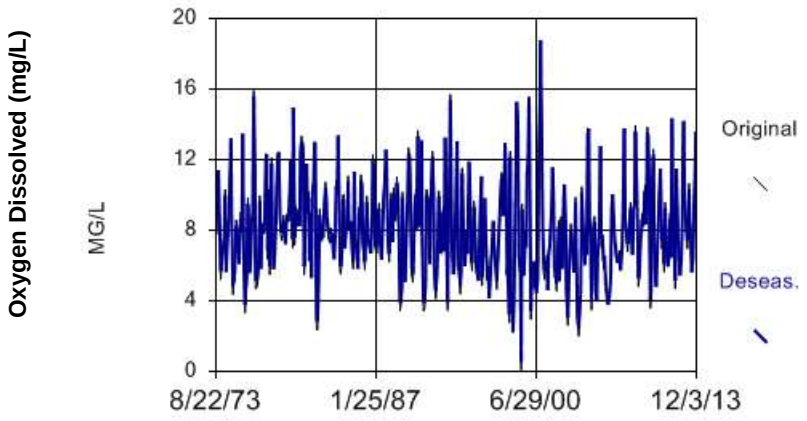


Figure D74 Assiniboine River: Oxygen Dissolved

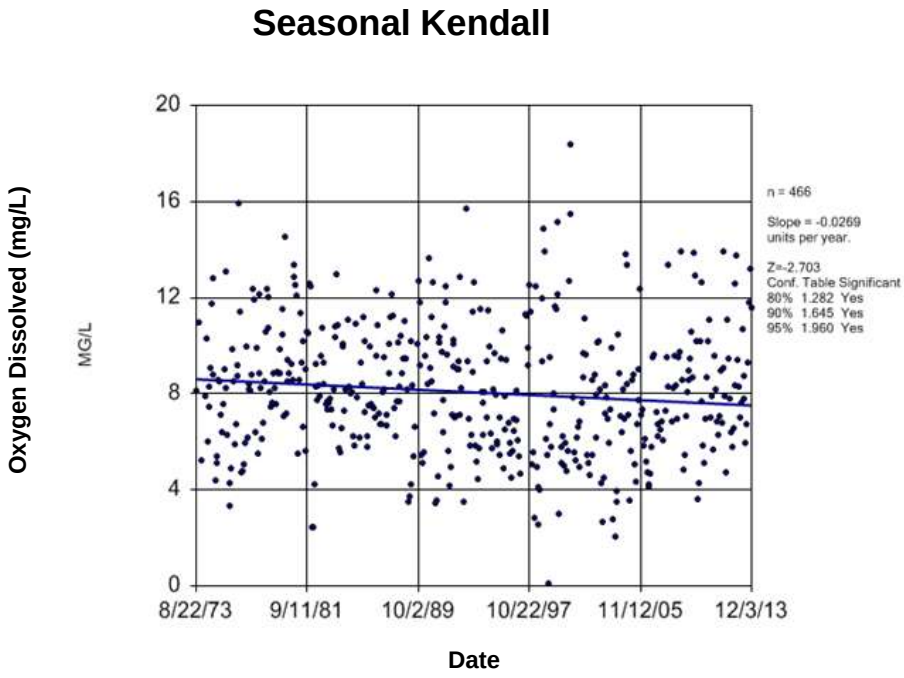


Figure D75 Assiniboine River: Oxygen Dissolved

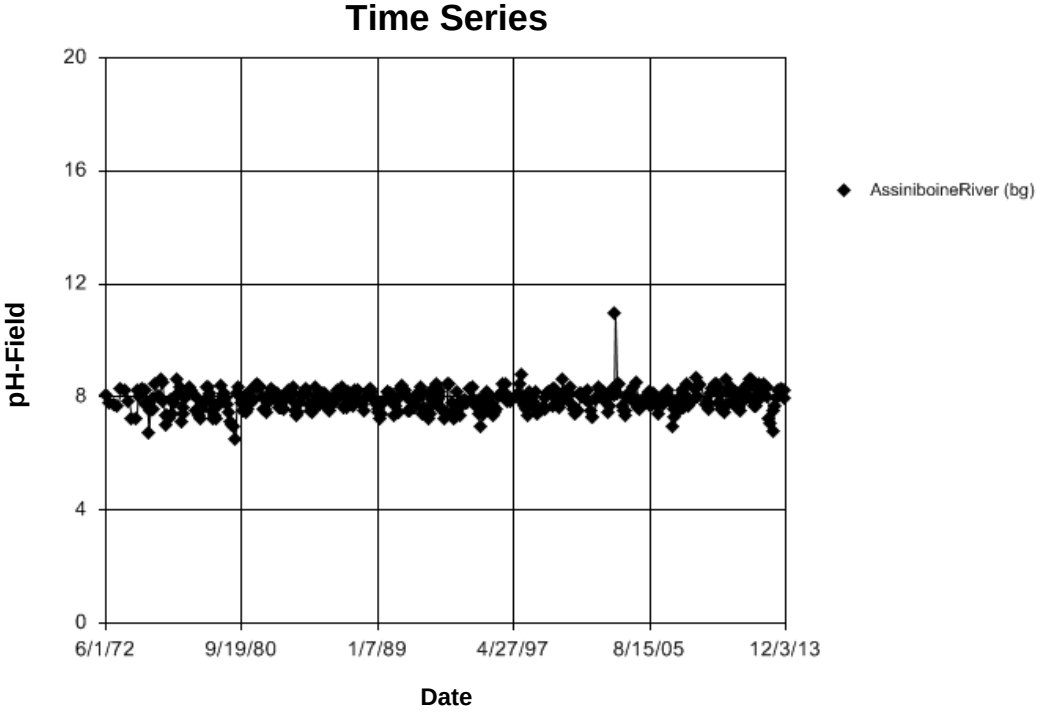


Figure D76 Assiniboine River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 106.2
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 81 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 106.2
Adjusted Kruskal-Wallis statistic (H') = 106.2

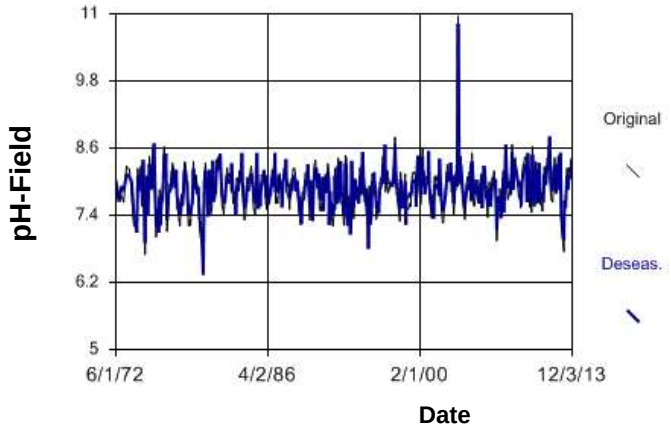


Figure D77 Assiniboine River: pH-Field

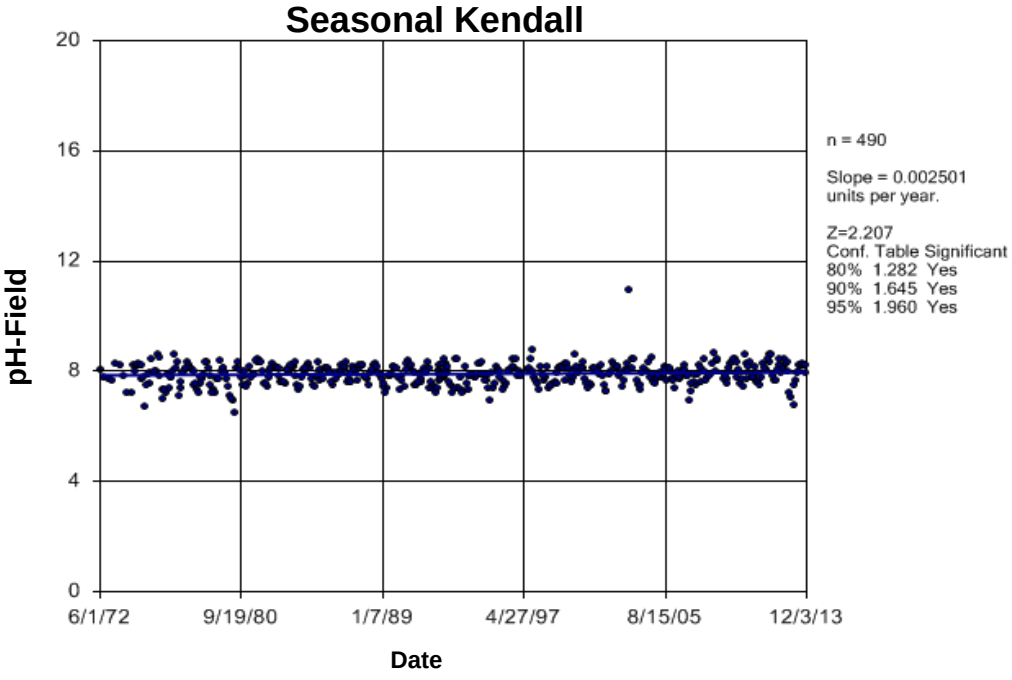


Figure D78 Assiniboine River: pH-Field

Time Series

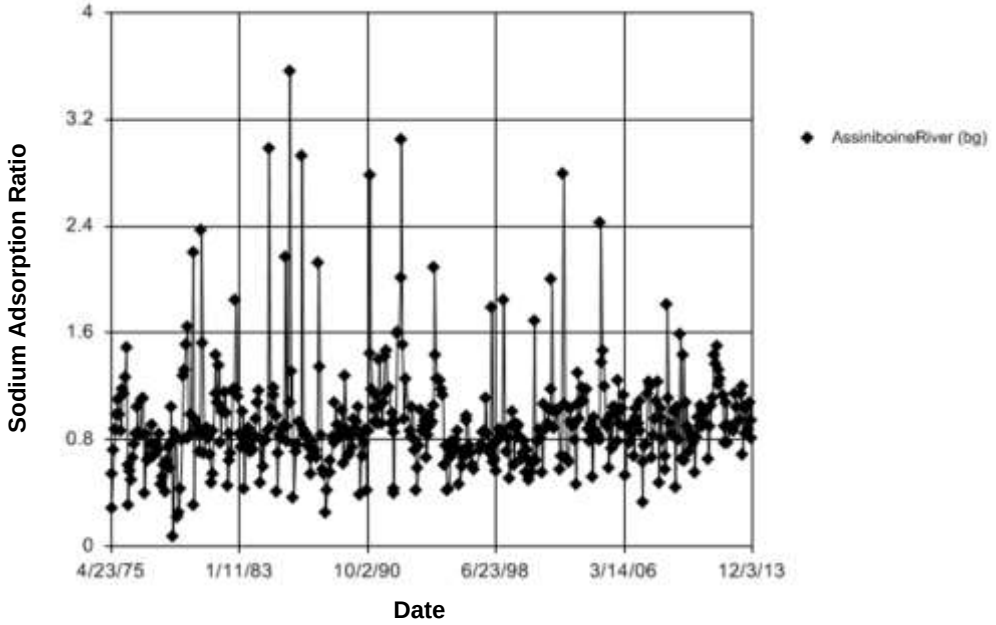


Figure D79 Assiniboine River: Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 25.12
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 23 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 25.12
Adjusted Kruskal-Wallis statistic (H') = 25.12

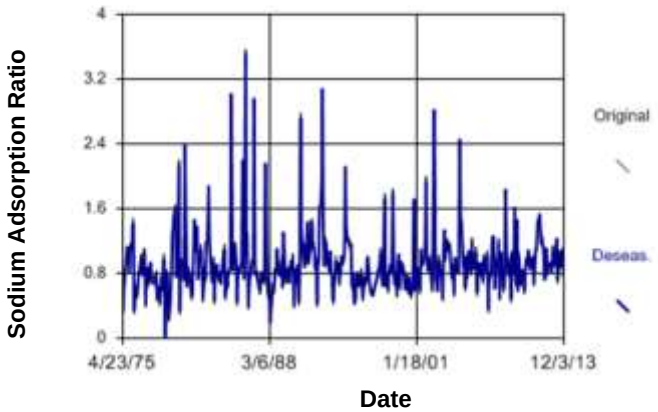


Figure D80 Assiniboine River: Sodium Adsorption Ratio

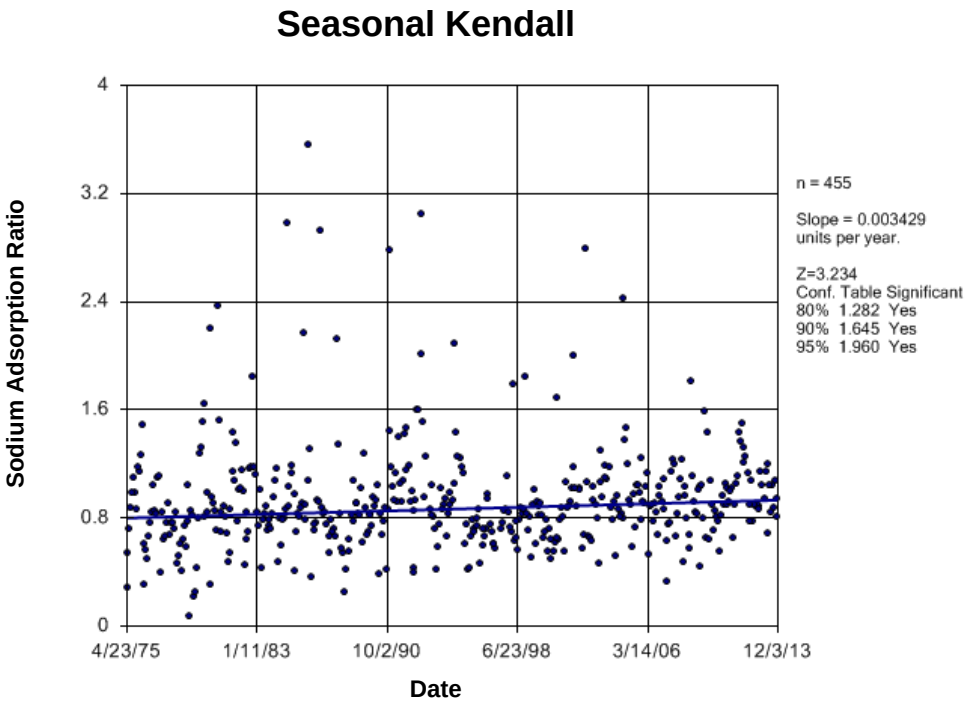


Figure D81 Assiniboine River: Sodium Adsorption Ratio

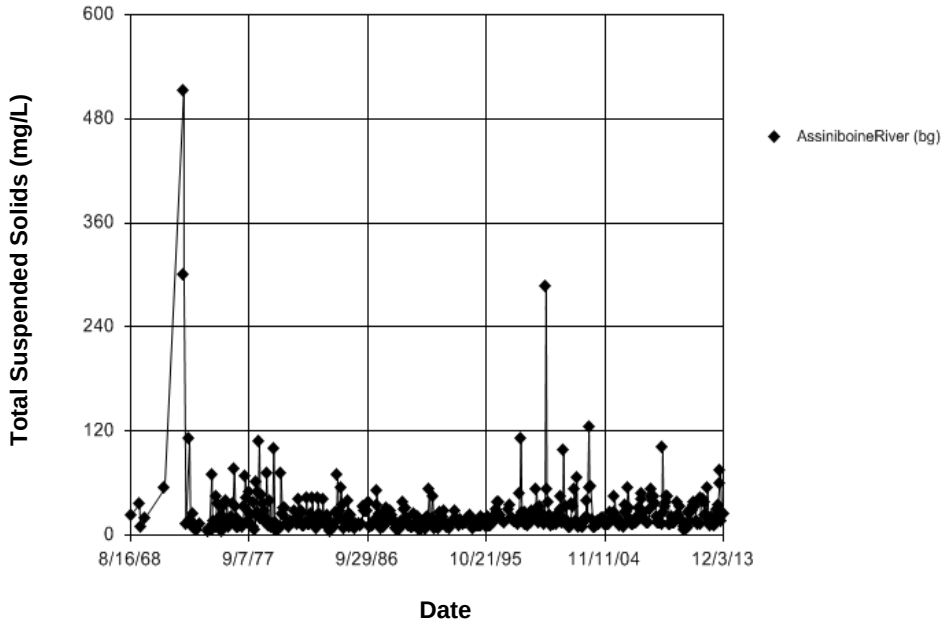


Figure D82 Assiniboine River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 103
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 29 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 103
Adjusted Kruskal-Wallis statistic (H') = 103

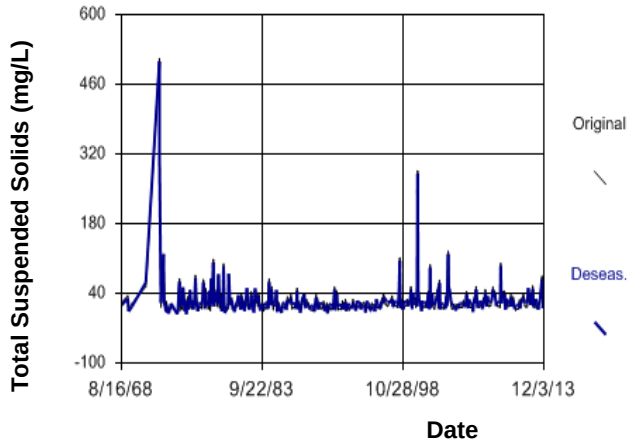


Figure D83 Assiniboine River: Total Suspended Solids

Seasonal Kendall

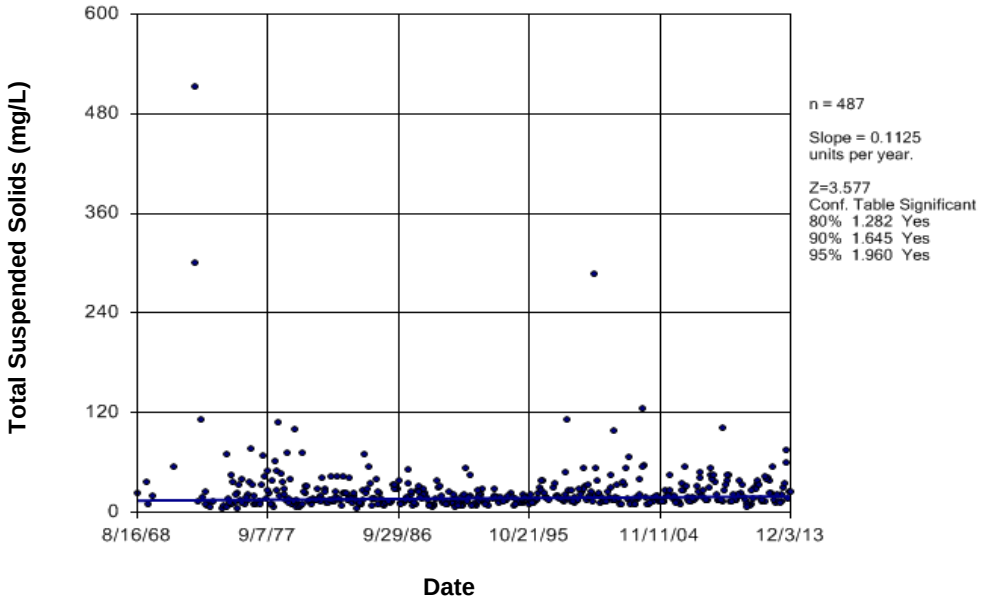


Figure D84 Assiniboine River: Total Suspended Solids

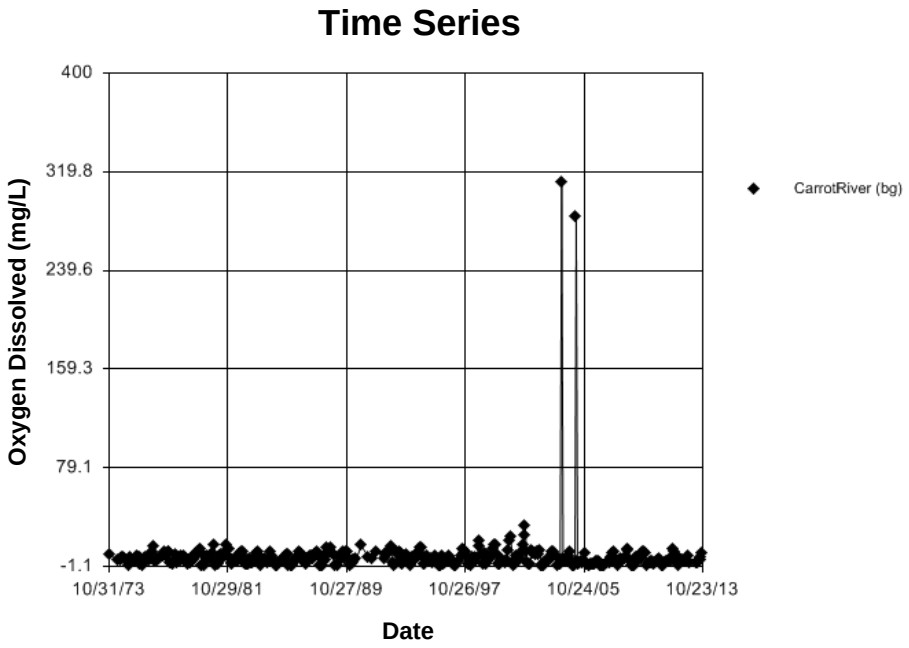


Figure D85 Carrot River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 68.46
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 15 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 68.46
Adjusted Kruskal-Wallis statistic (H') = 68.46

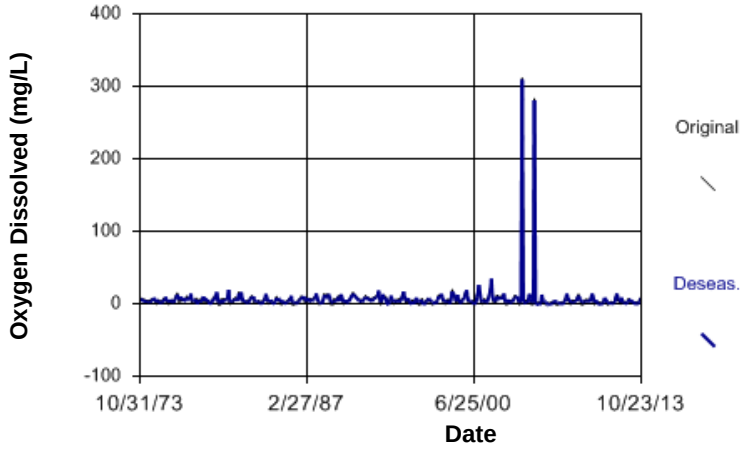


Figure D86 Carrot River: Oxygen Dissolved

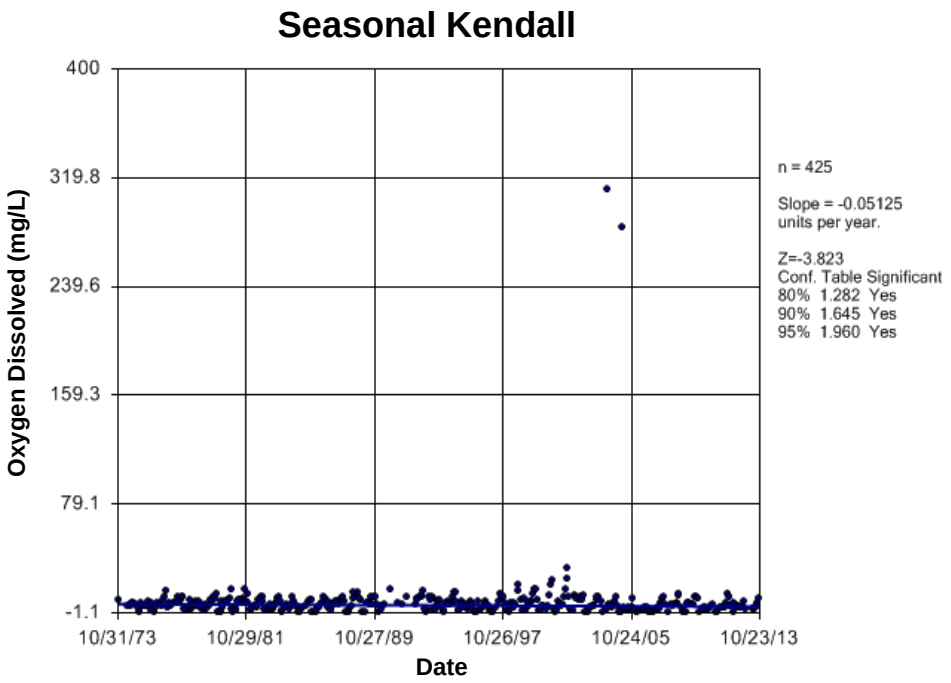


Figure D87 Carrot River: Oxygen Dissolved

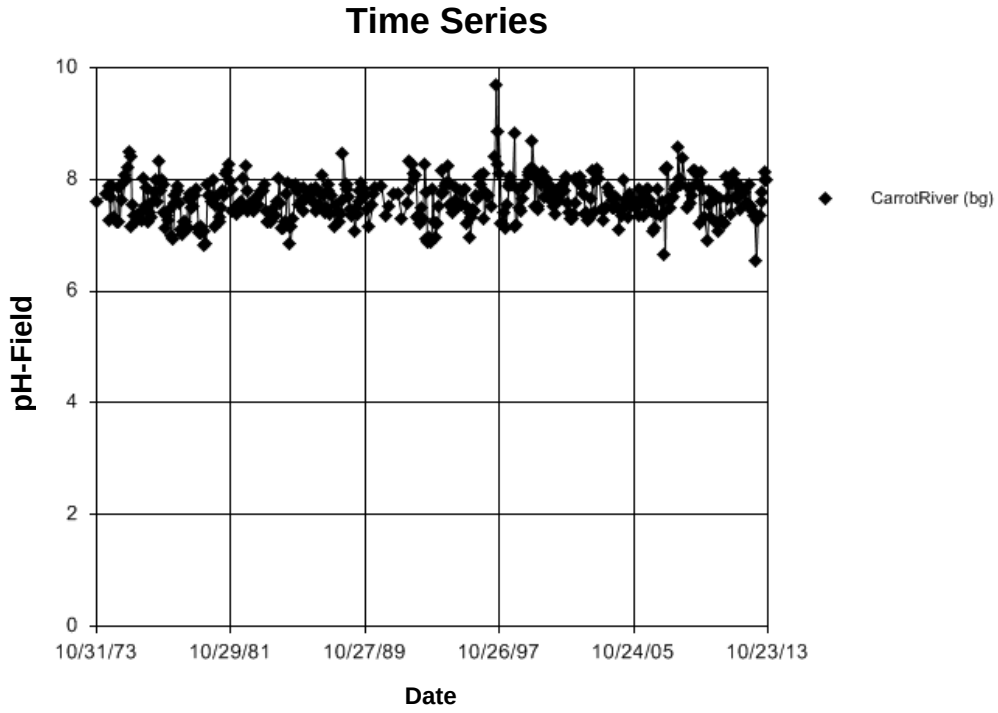


Figure D88 Carrot River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 82.28
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 65 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 82.28
Adjusted Kruskal-Wallis statistic (H') = 82.28

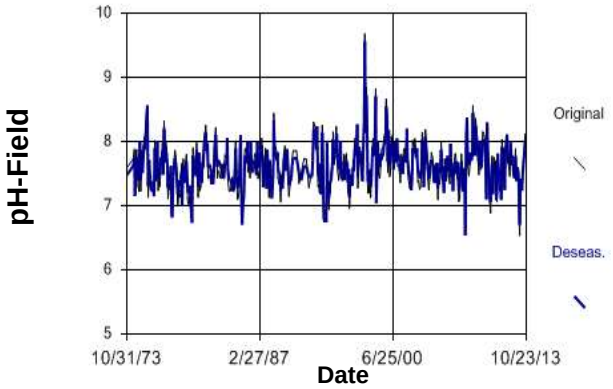


Figure D89 Carrot River: pH-Field

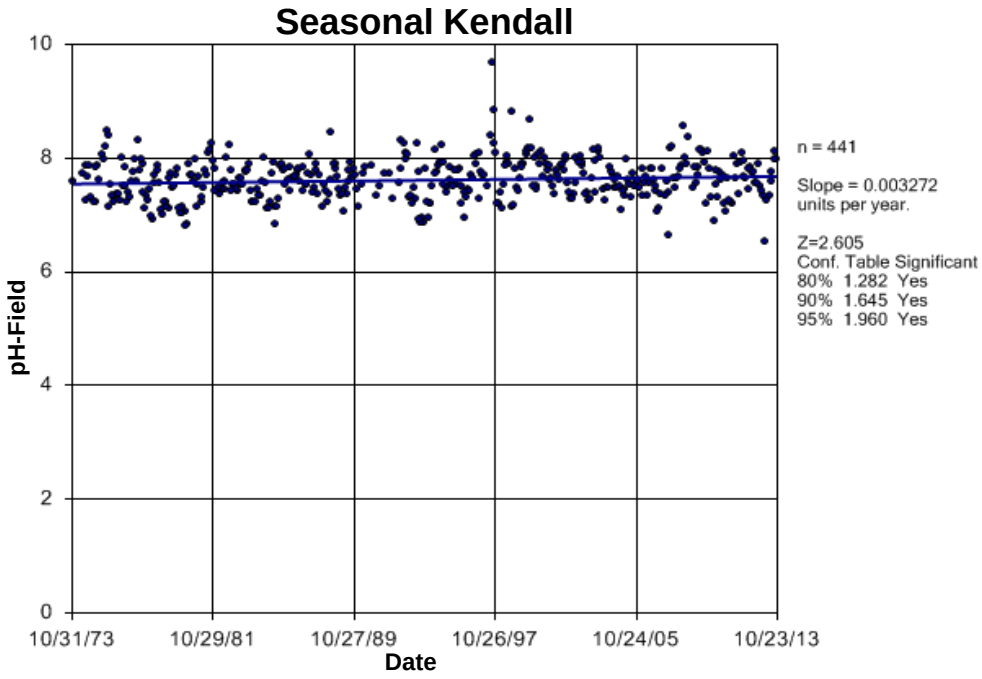


Figure D90 Carrot River: pH-Field

Time Series

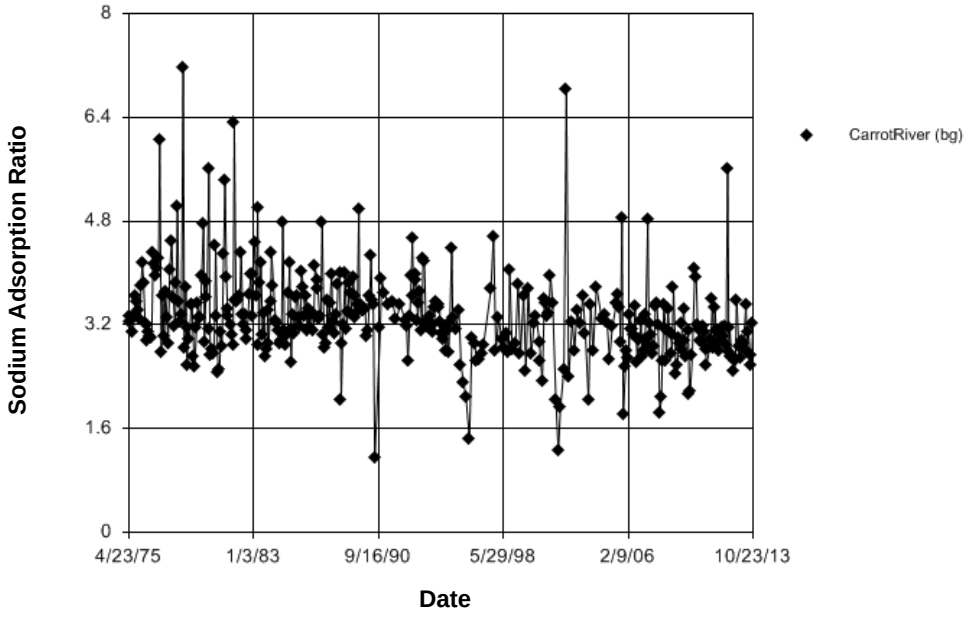


Figure D91 Carrot River: Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 6.845
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 33 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 6.845
Adjusted Kruskal-Wallis statistic (H') = 6.845

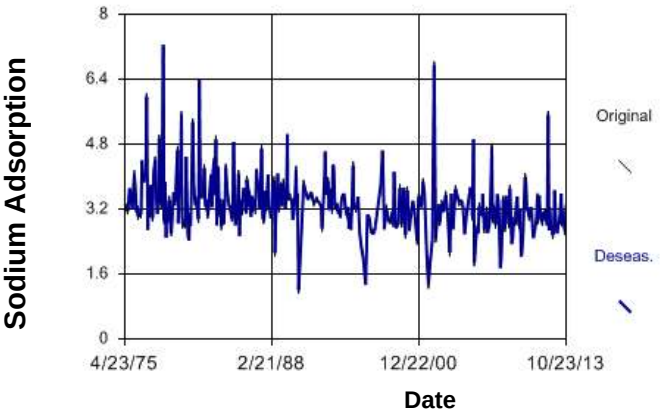


Figure D92 Carrot River: Sodium Adsorption Ratio

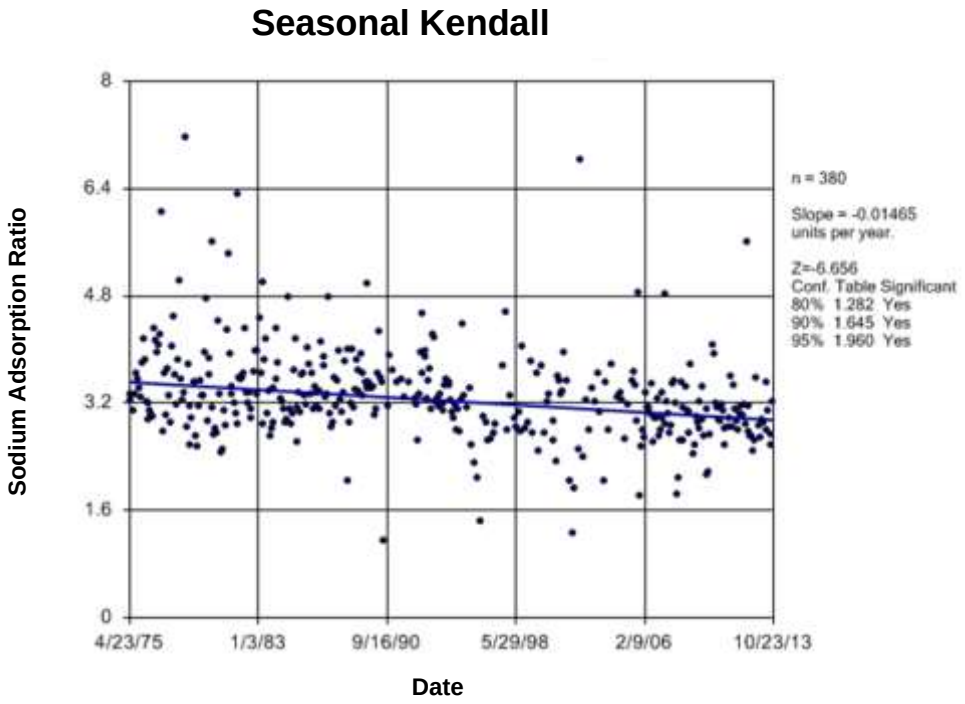


Figure D93 Carrot River: Sodium Adsorption Ratio

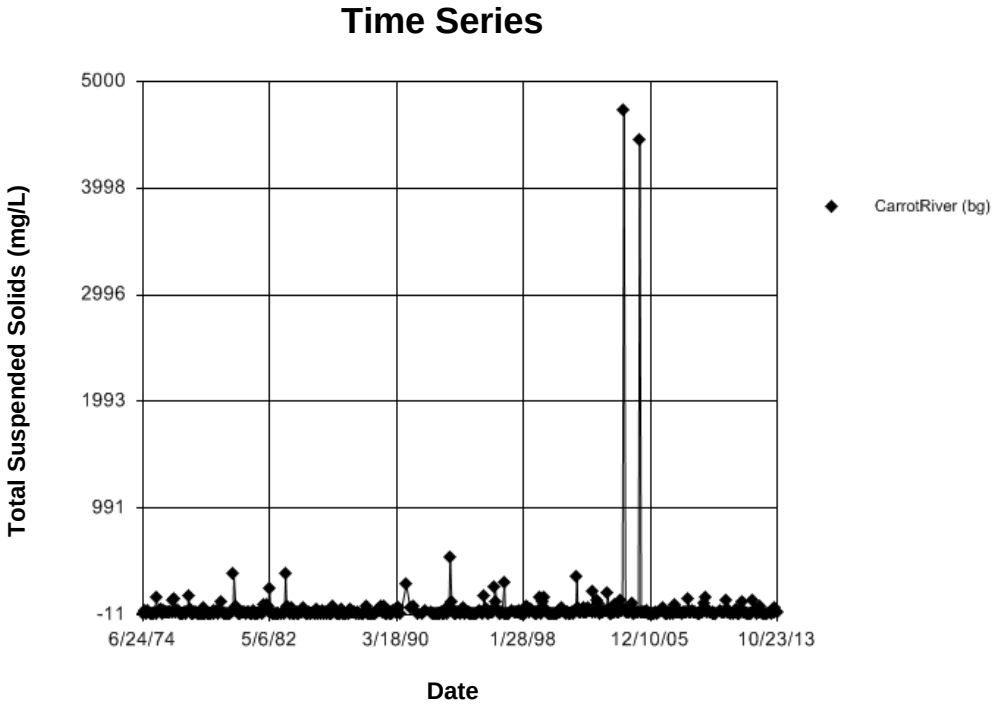


Figure D94 Carrot River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 45.53
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 45.53
Adjusted Kruskal-Wallis statistic (H') = 45.53

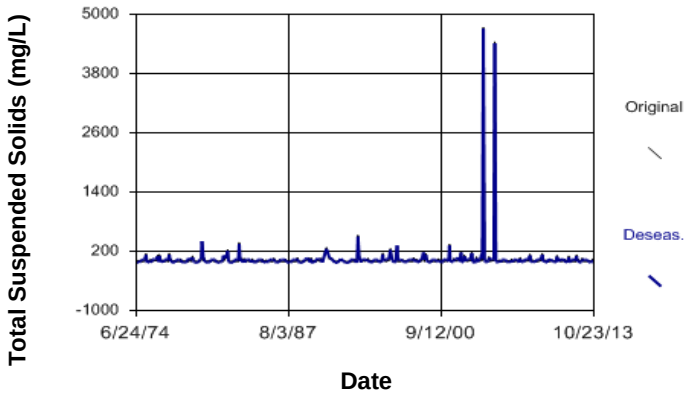


Figure D95 Carrot River: Total Suspended Solids

Seasonal Kendall

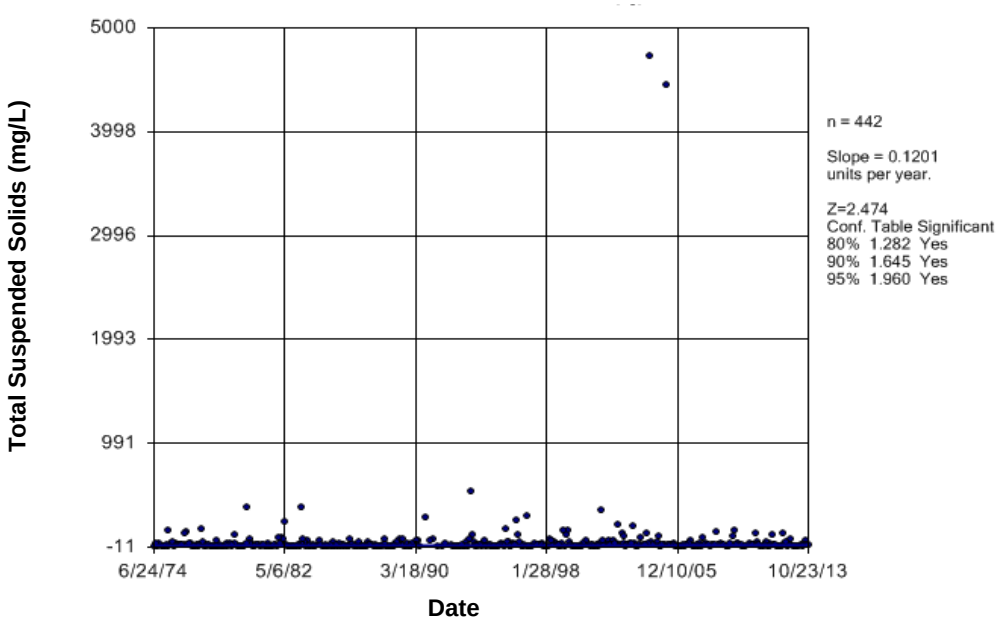


Figure D96 Carrot River: Total Suspended Solids

Time Series

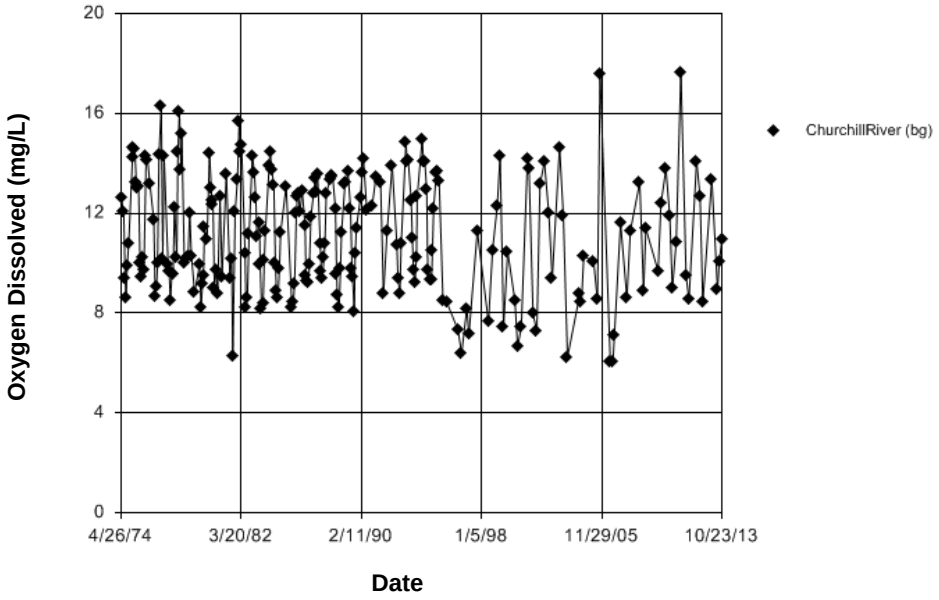


Figure D97 Churchill River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 100.5
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 16 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 100.5
Adjusted Kruskal-Wallis statistic (H') = 100.5

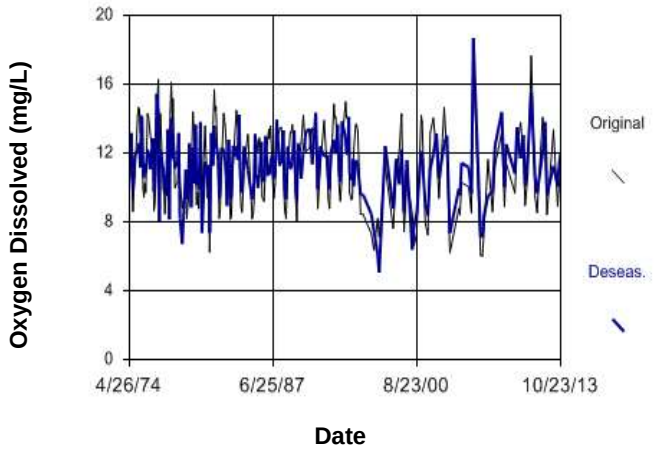


Figure D98 Churchill River: Oxygen Dissolved

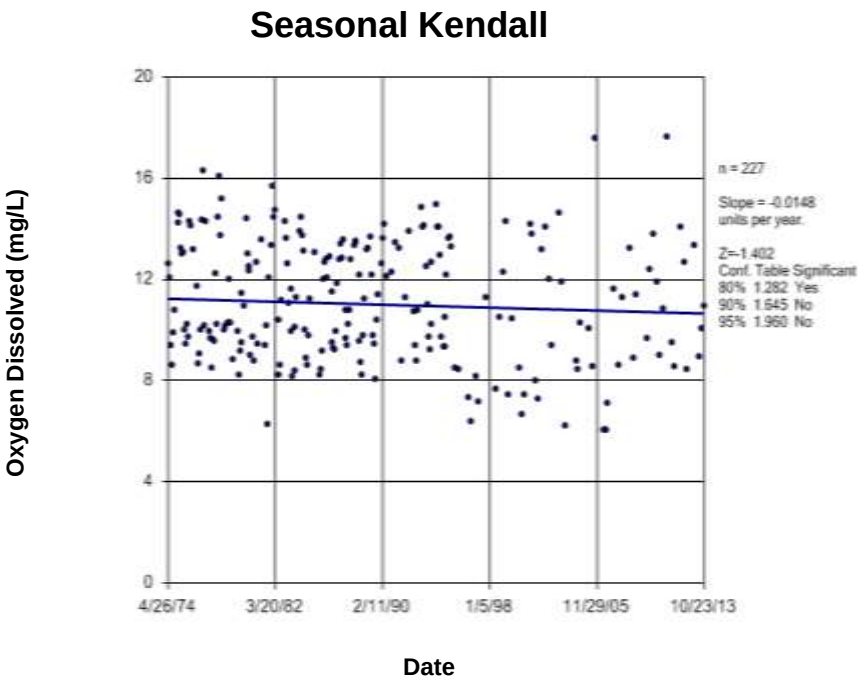


Figure D99 Churchill River: Oxygen Dissolved

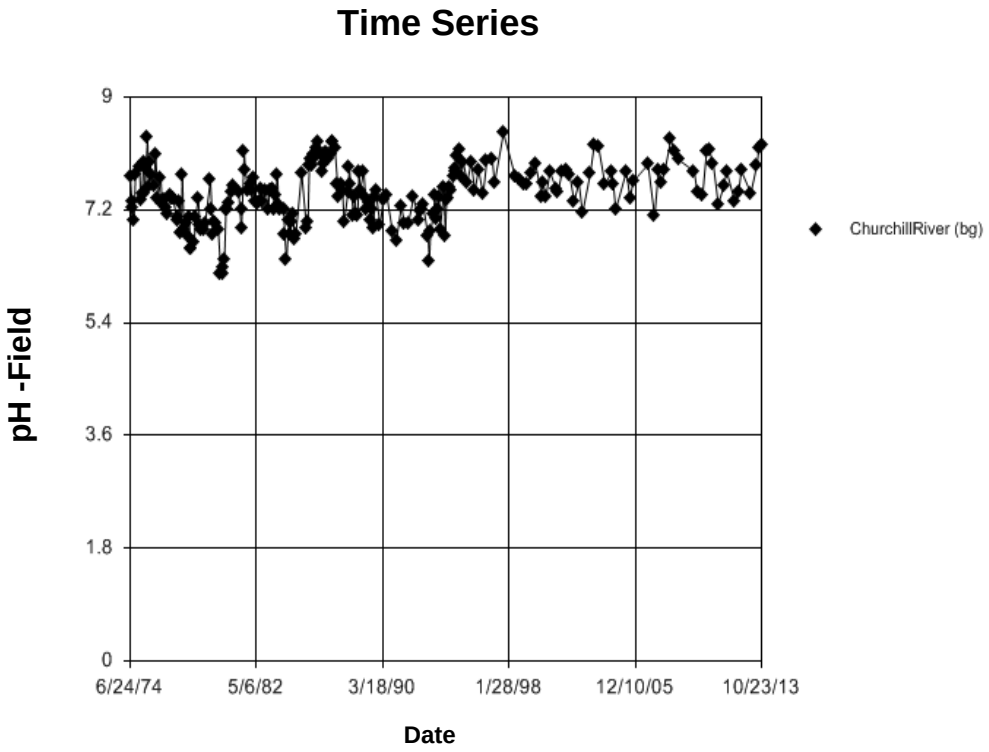


Figure D100 Churchill River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1313
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 17 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1313
Adjusted Kruskal-Wallis statistic (H') = 0.1313

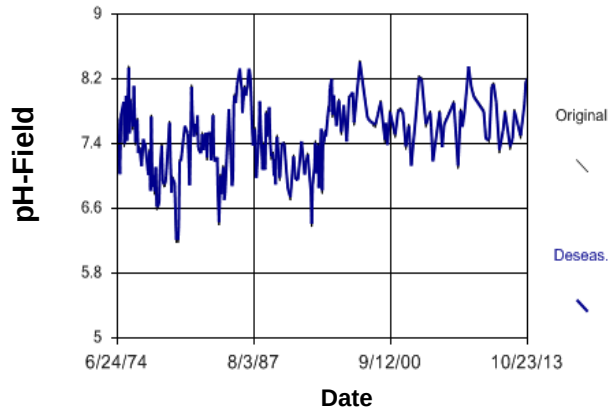


Figure D101 Churchill River: pH-Field

Sen's Slope Estimator

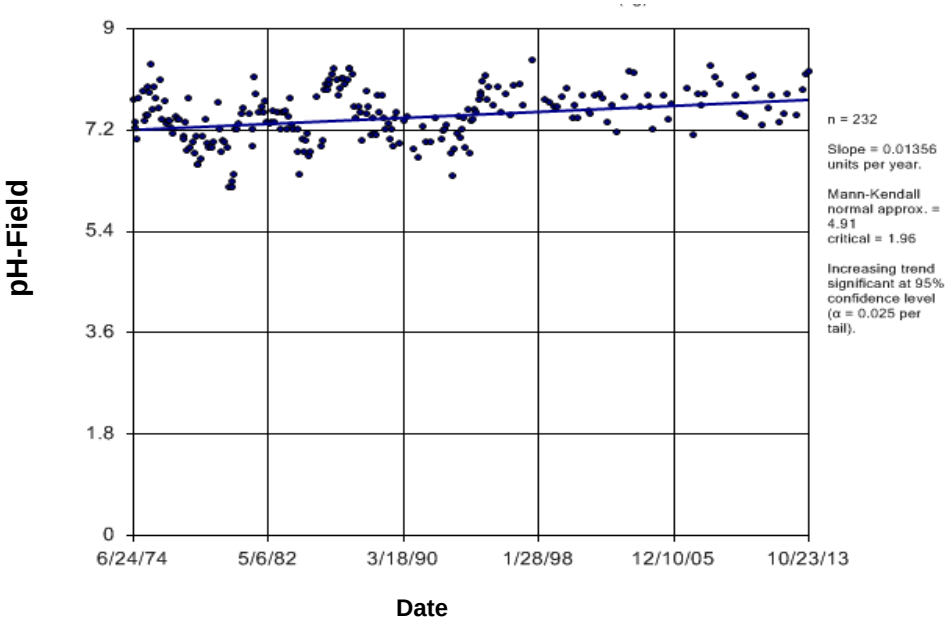


Figure D102 Churchill River: pH-Field

Time Series

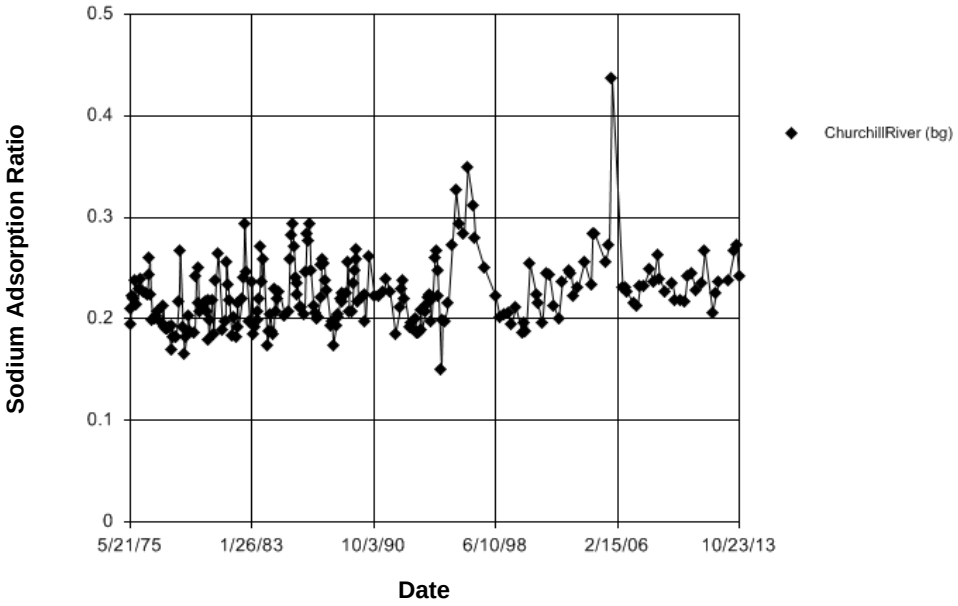


Figure D103 Churchill River: Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 20.15
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 23 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 20.15
Adjusted Kruskal-Wallis statistic (H') = 20.15

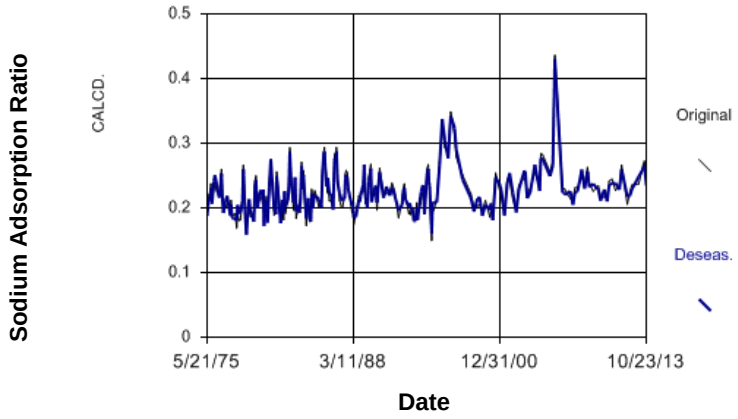


Figure D104 Churchill River: Sodium Adsorption Ratio

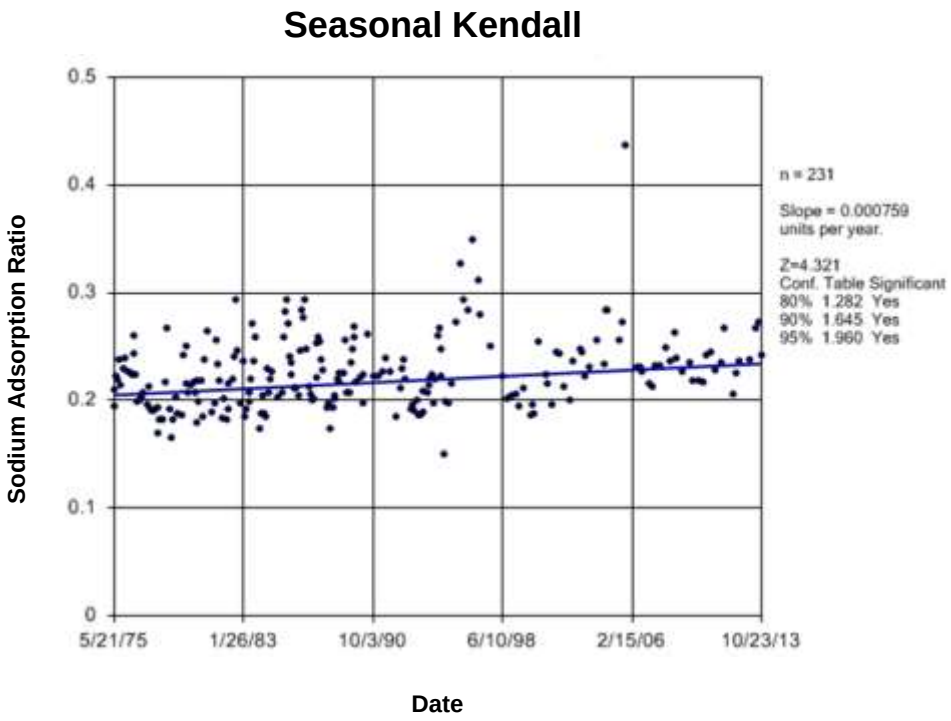


Figure D105 Churchill River: Sodium Adsorption Ratio

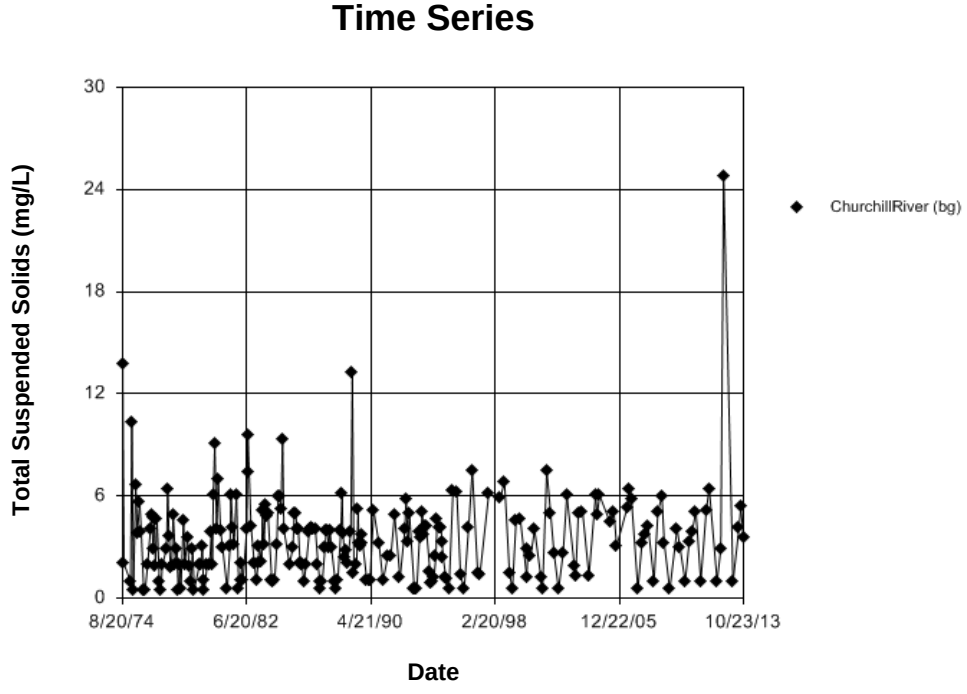


Figure D106 Churchill River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 113.7
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 113.7
Adjusted Kruskal-Wallis statistic (H') = 113.7

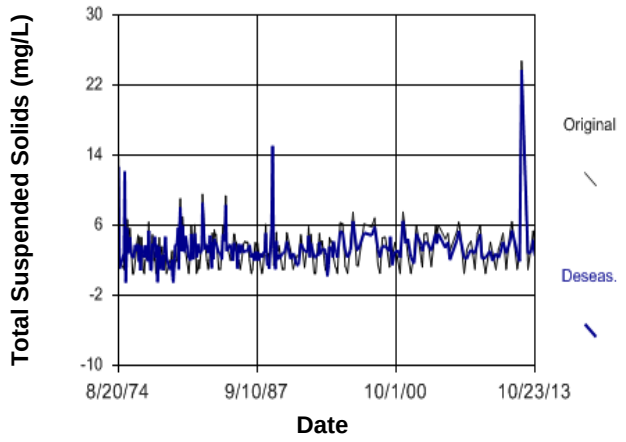


Figure D107 Churchill River: Total Suspended Solids

Seasonal Kendall

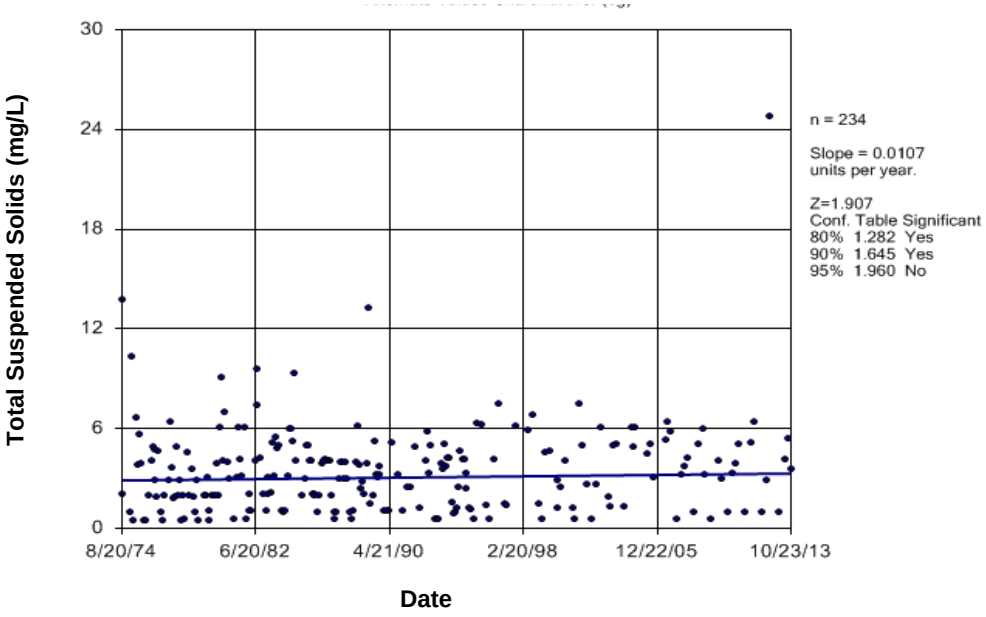


Figure D108 Churchill River: Total Suspended Solids

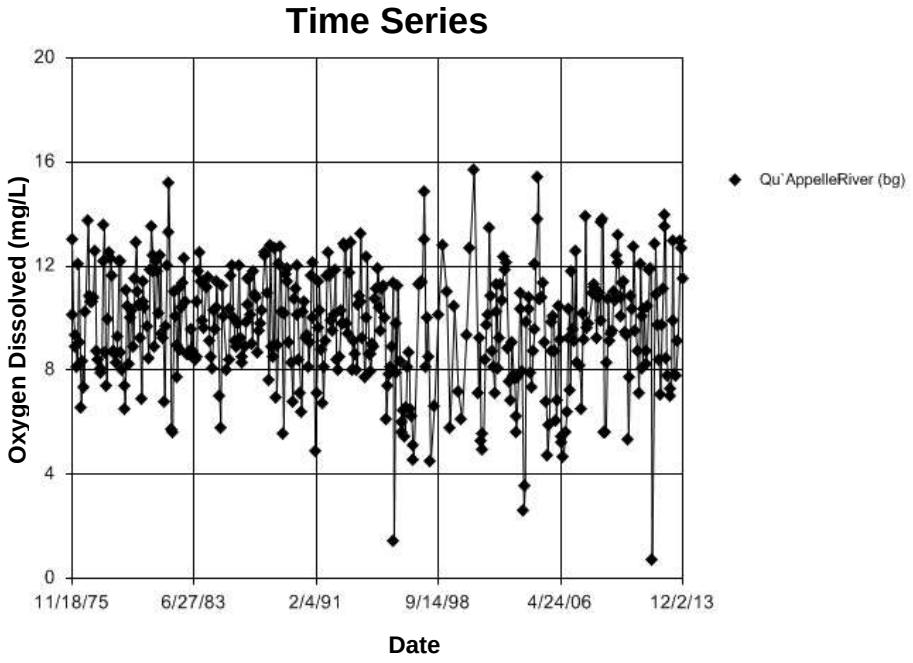


Figure D109 Qu'Appelle River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 5.76
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 49 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 5.76
Adjusted Kruskal-Wallis statistic (H') = 5.76

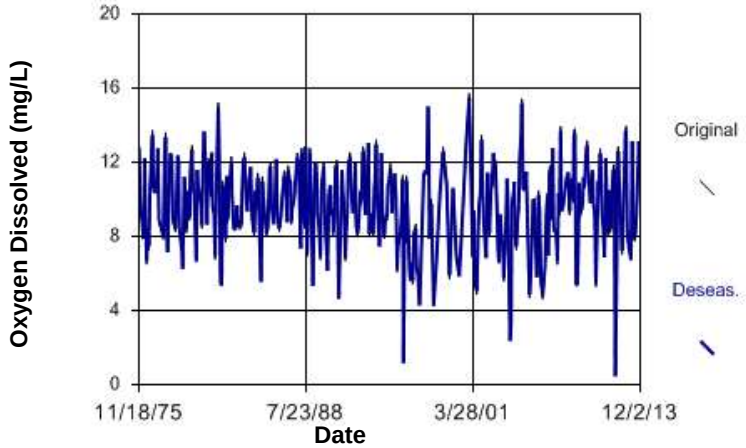


Figure D110 Qu'Appelle River: Oxygen Dissolved

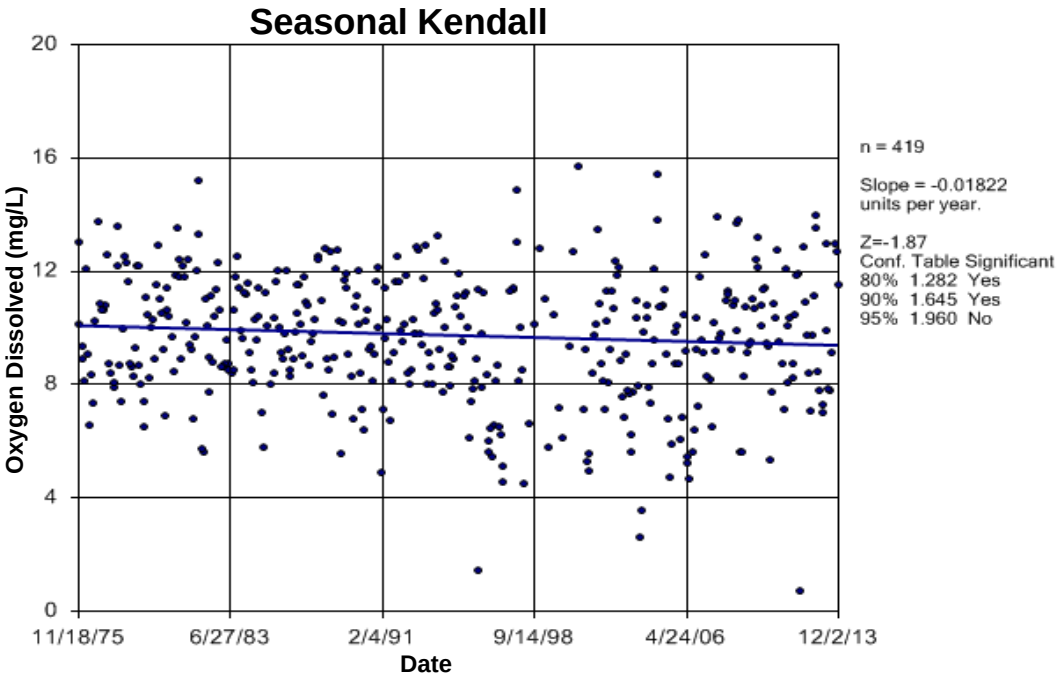


Figure D111 Qu'Appelle River: Oxygen Dissolved

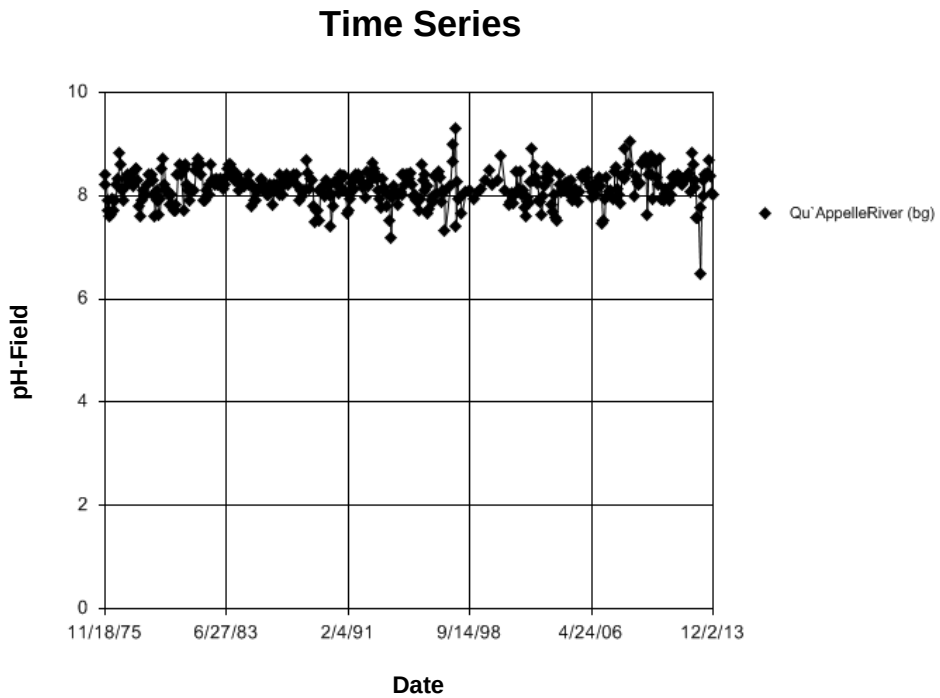


Figure D112 Qu'Appelle River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 30.92
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 77 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 30.92
Adjusted Kruskal-Wallis statistic (H') = 30.92

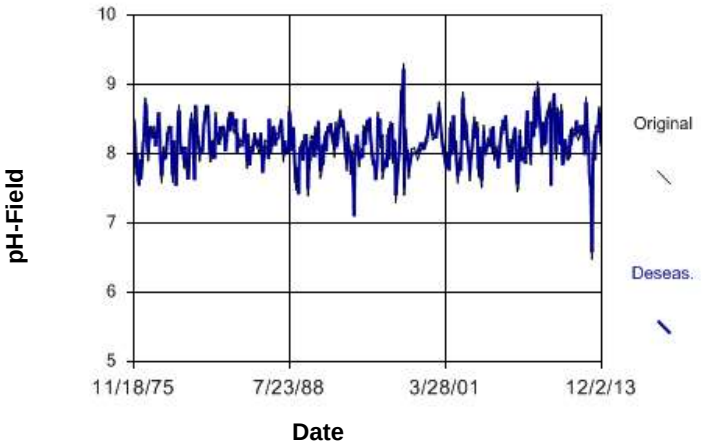


Figure D113 Qu'Appelle River: pH-Field

Seasonal Kendall

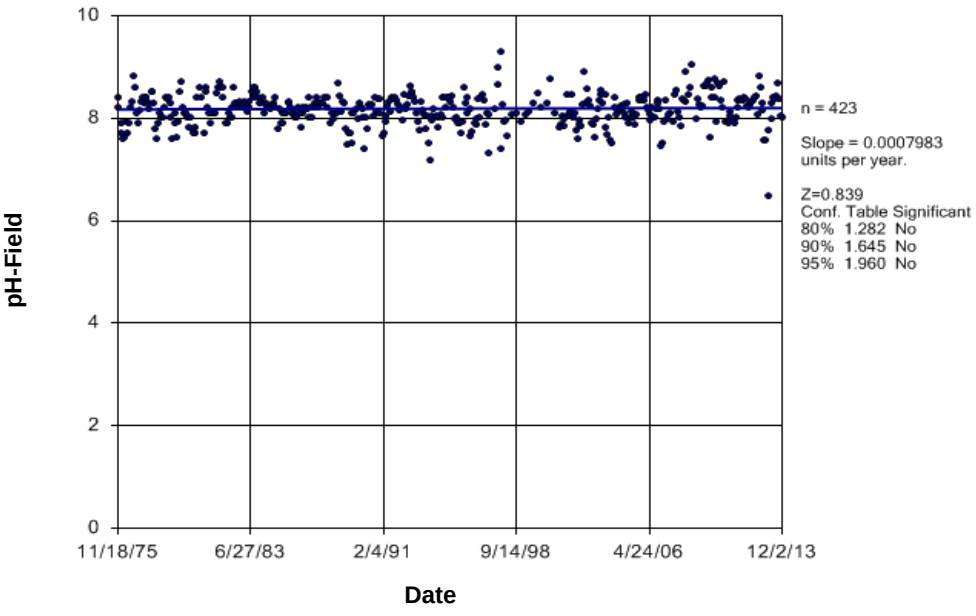


Figure D114 Qu'Appelle River: pH-Field

Time Series

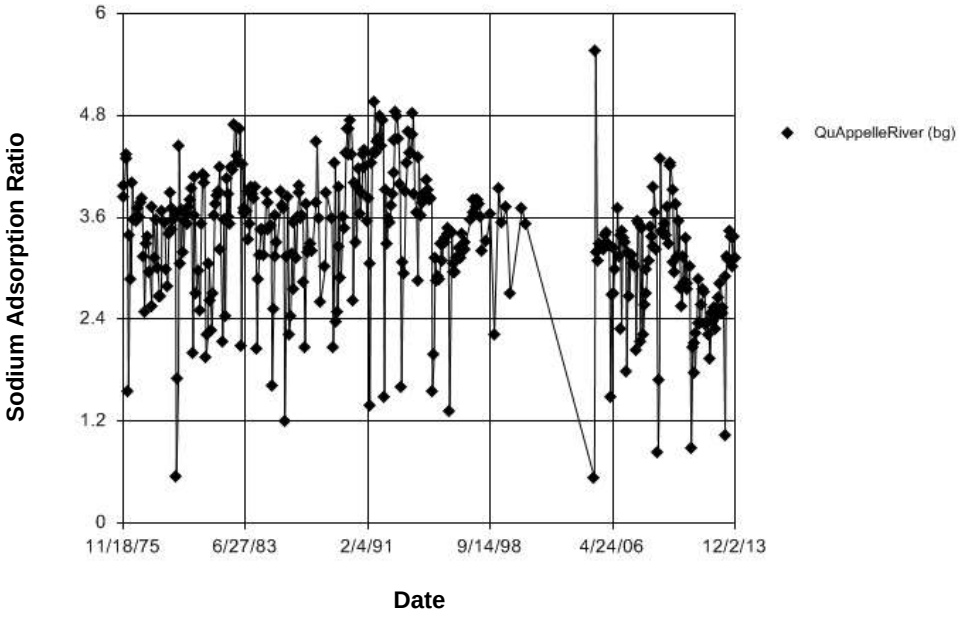


Figure D115 Qu'Appelle River: Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.6268
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 24 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.6268
Adjusted Kruskal-Wallis statistic (H') = 0.6268

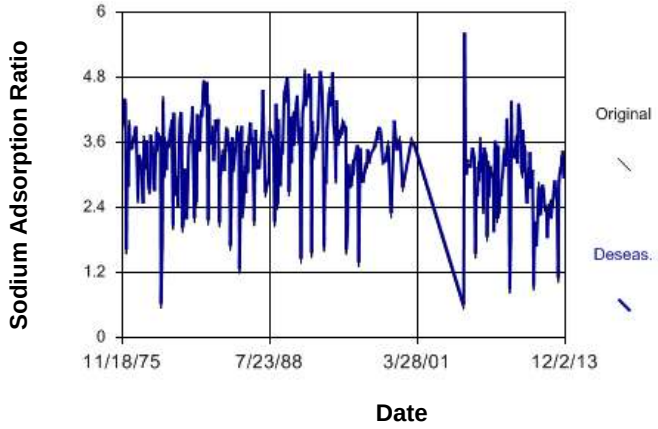


Figure D116 Qu'Appelle River: Sodium Adsorption Ratio

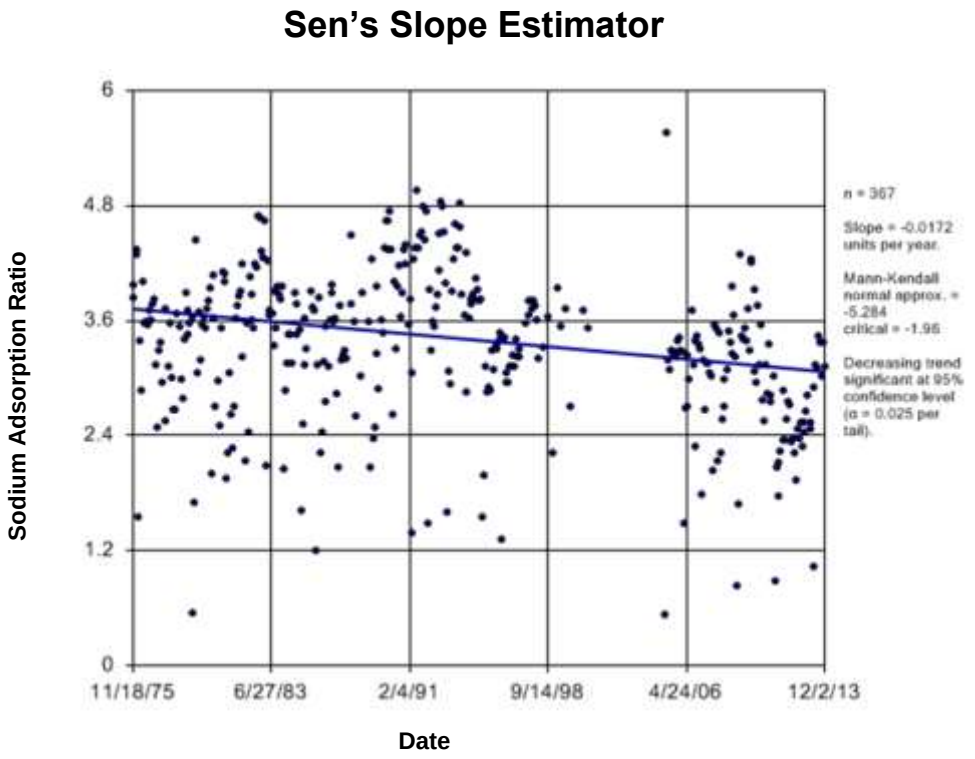


Figure D117 Qu'Appelle River: Sodium Adsorption Ratio

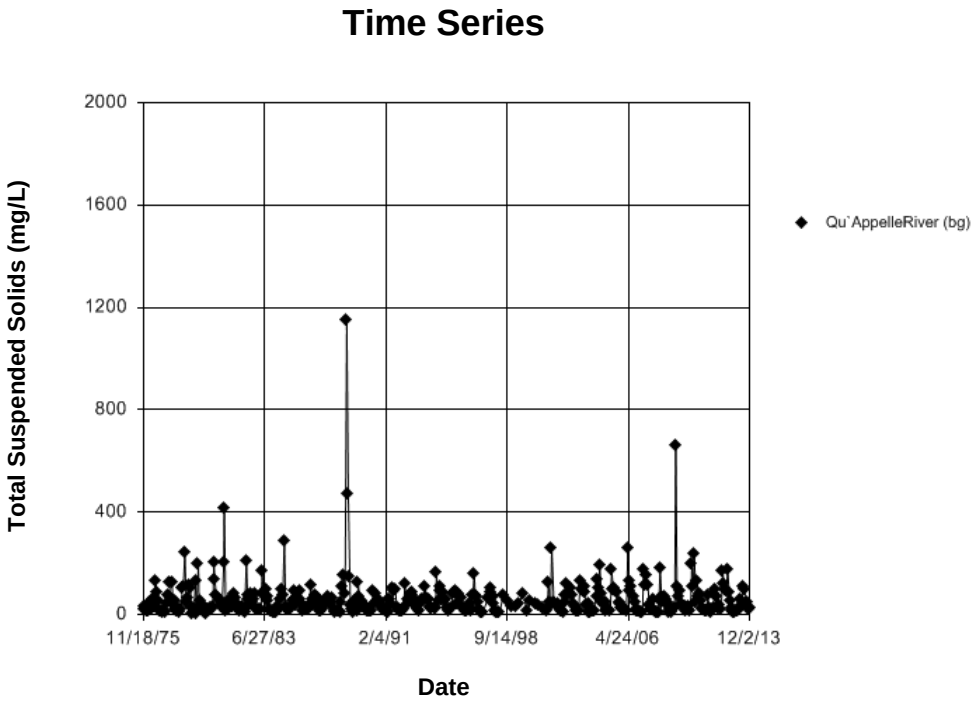


Figure D118 Qu'Appelle River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 216.9
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 12 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 216.9
Adjusted Kruskal-Wallis statistic (H') = 216.9

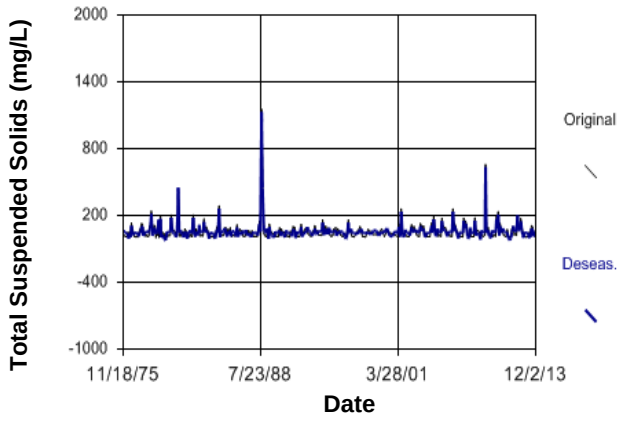


Figure D119 Qu'Appelle River: Total Suspended Solids

Seasonal Kendall

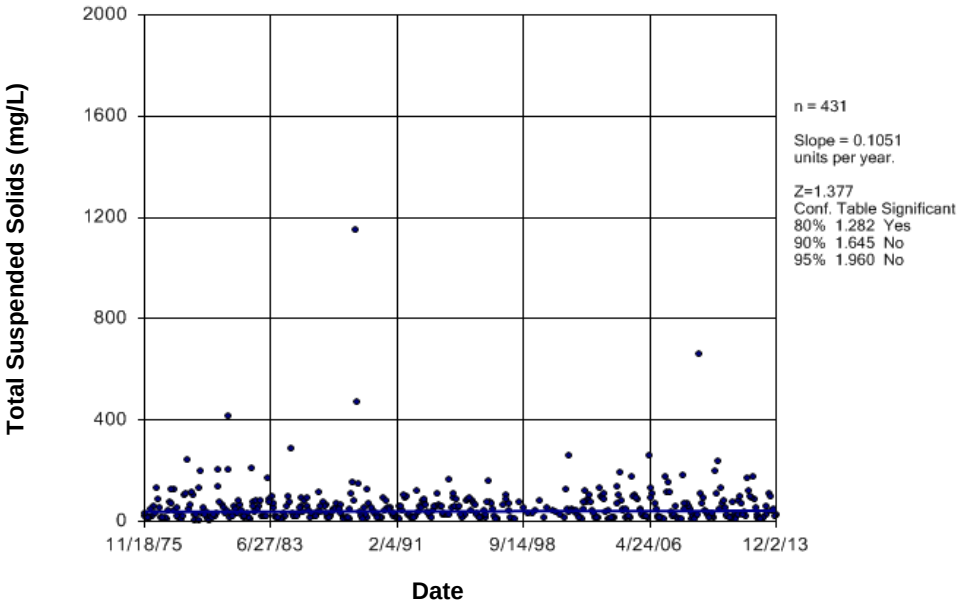


Figure D120 Qu'Appelle River: Total Suspended Solids

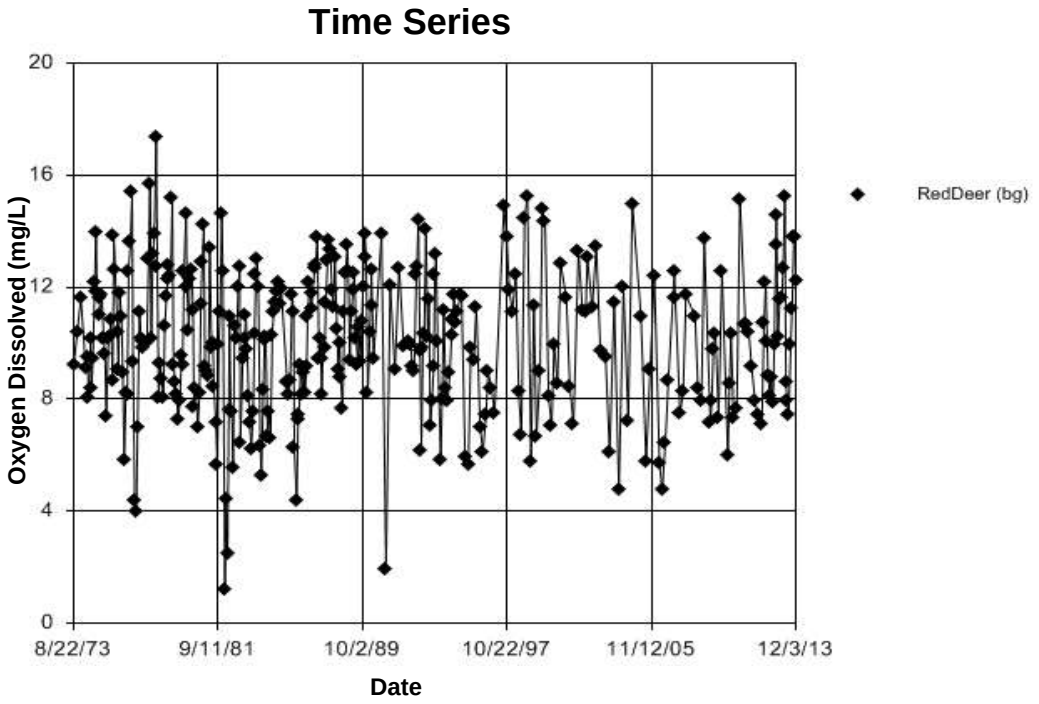


Figure D121 Red Deer River (MB-SK): Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 18.03
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 30 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 18.03
Adjusted Kruskal-Wallis statistic (H') = 18.03

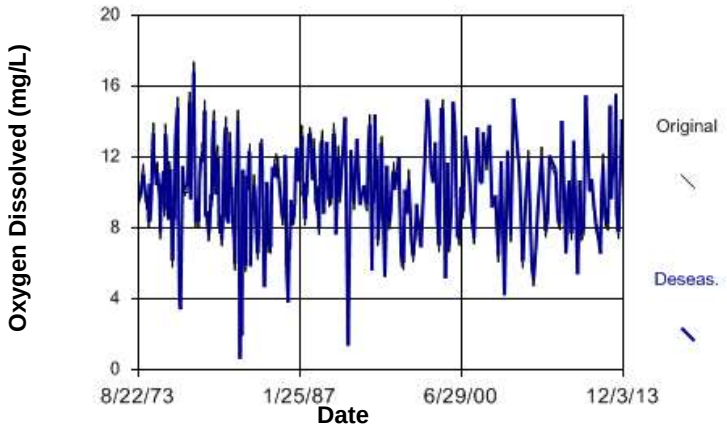


Figure D122 Red Deer River (SK-MB): Oxygen Dissolved

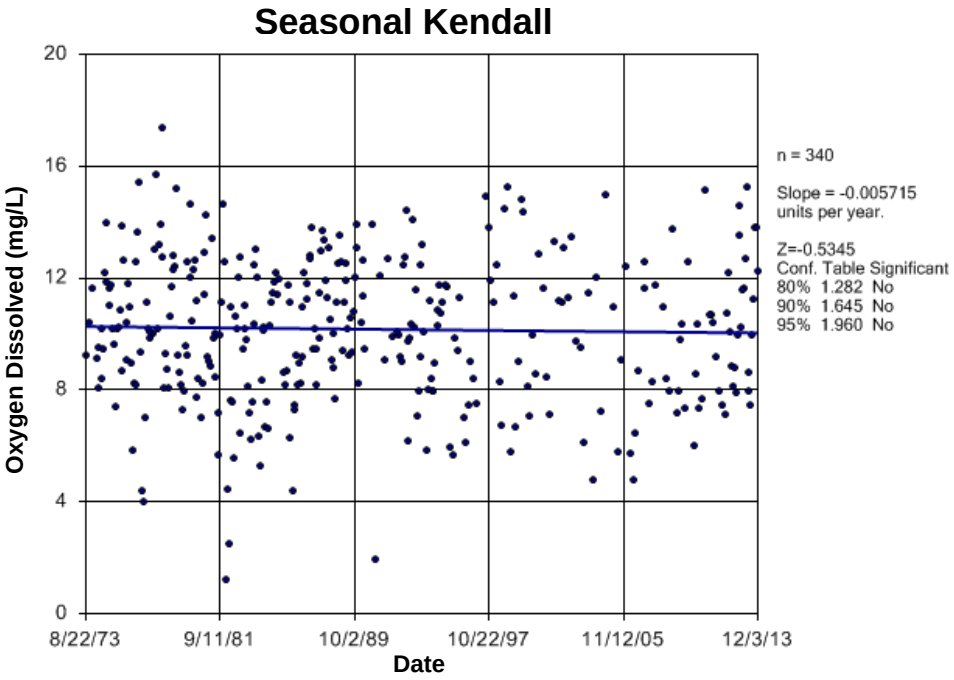


Figure D123 Red Deer River (SK-MB): Oxygen Dissolved

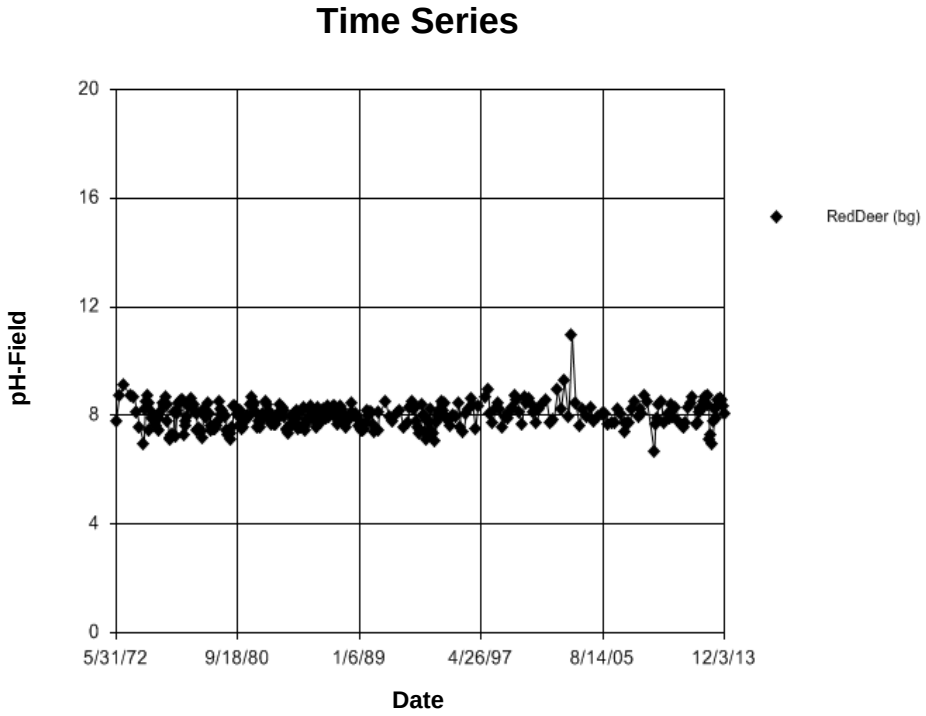


Figure D124 Red Deer River (MB-SK): pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 67.48
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 39 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 67.48
Adjusted Kruskal-Wallis statistic (H') = 67.48

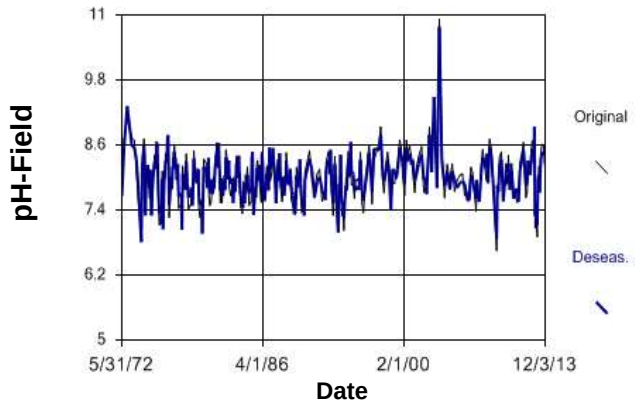


Figure D125 Red Deer River (SK-MB): pH-Field

Seasonal Kendall

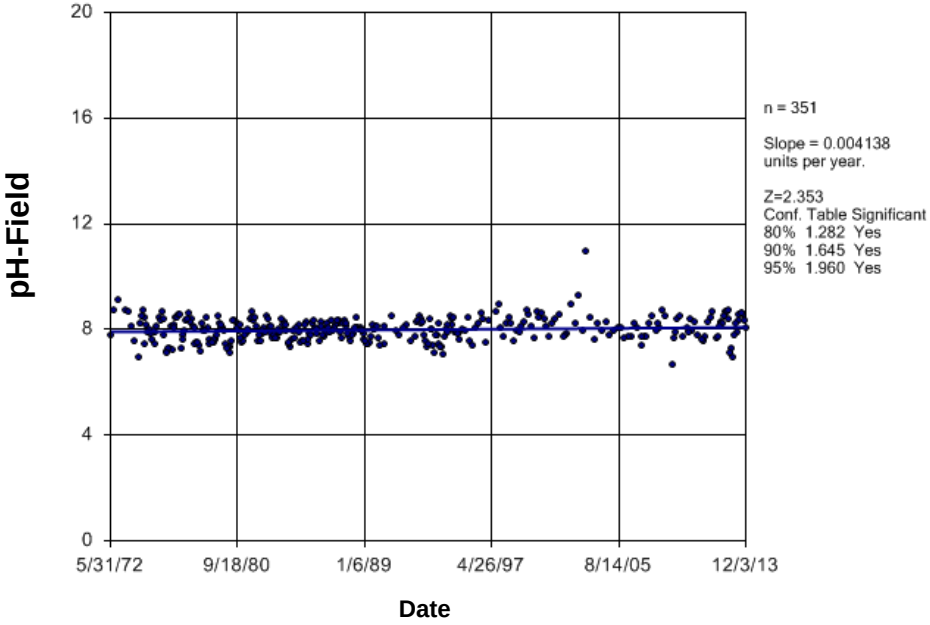


Figure D126 Red Deer River (SK-MB): pH-Field

Time Series

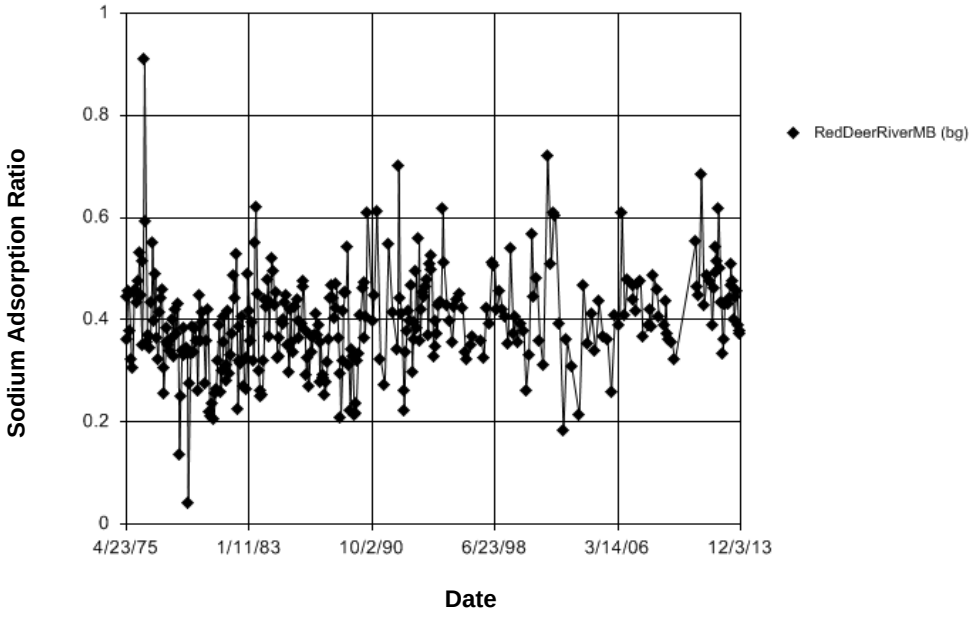


Figure D127 Red Deer River (MB-SK): Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.198
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 18 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.198
Adjusted Kruskal-Wallis statistic (H') = 4.198

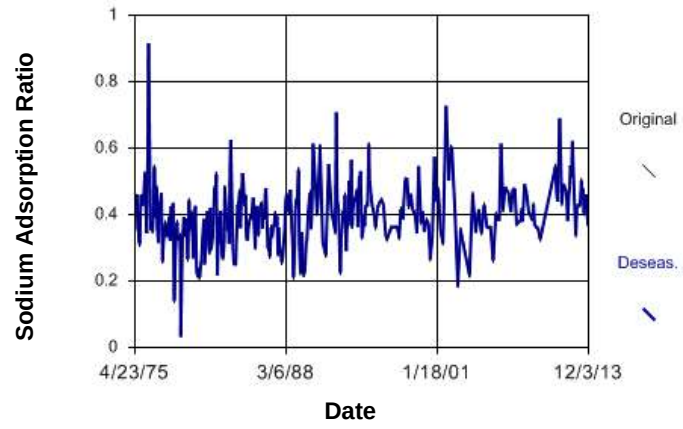


Figure D128 Red Deer River (SK-MB): Sodium Adsorption Ratio

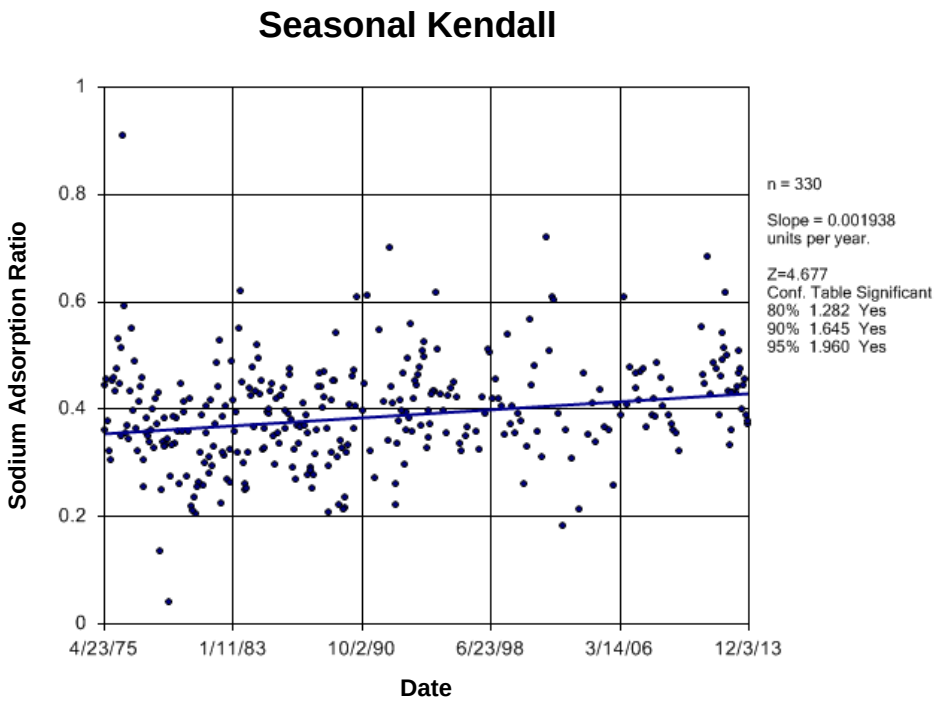


Figure D129 Red Deer River (SK-MB): Sodium Adsorption Ratio

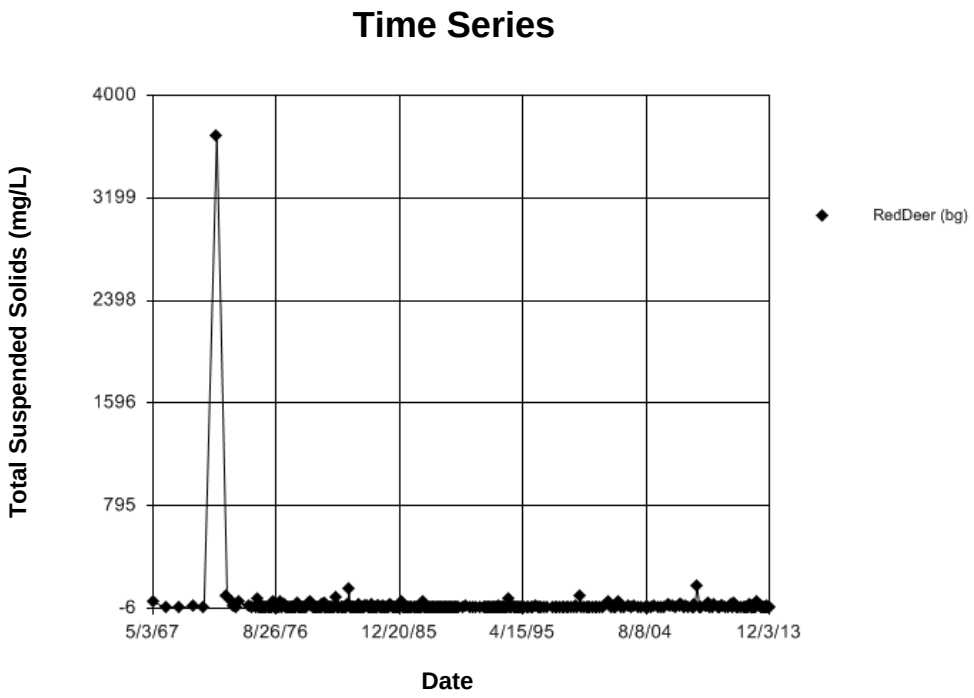


Figure D130 Red Deer River (MB-SK): Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1935
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1935
Adjusted Kruskal-Wallis statistic (H') = 0.1935

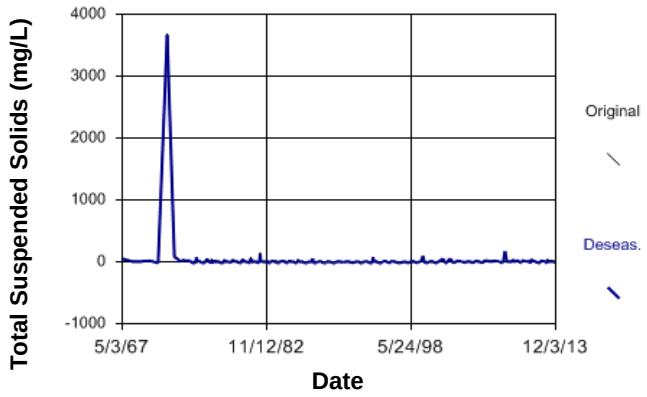


Figure D131 Red Deer River (SK-MB): Total Suspended Solids

Seasonal Kendall

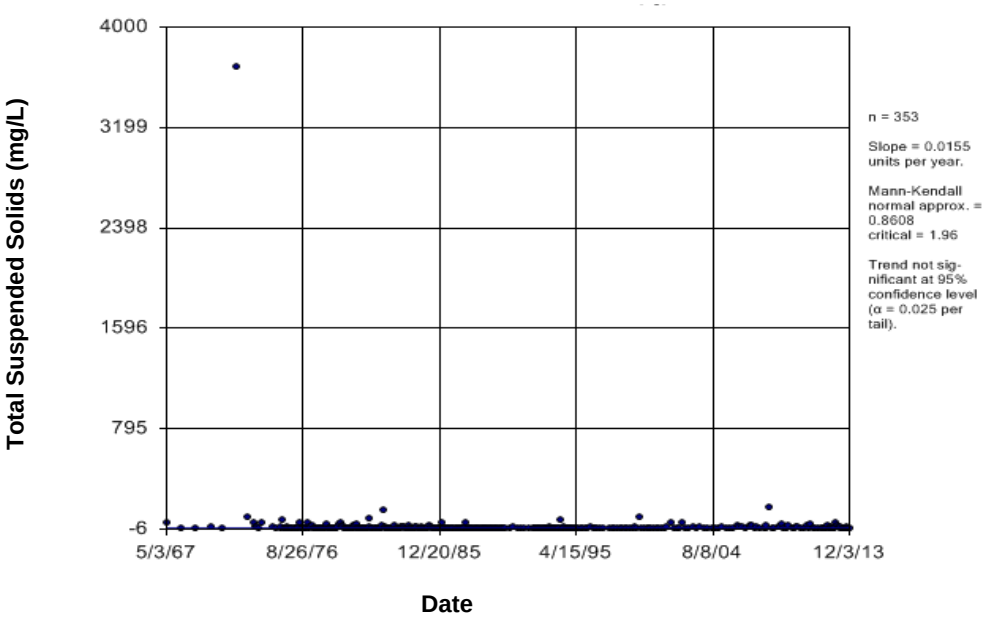


Figure D132 Red Deer River (SK-MB): Total Suspended Solids

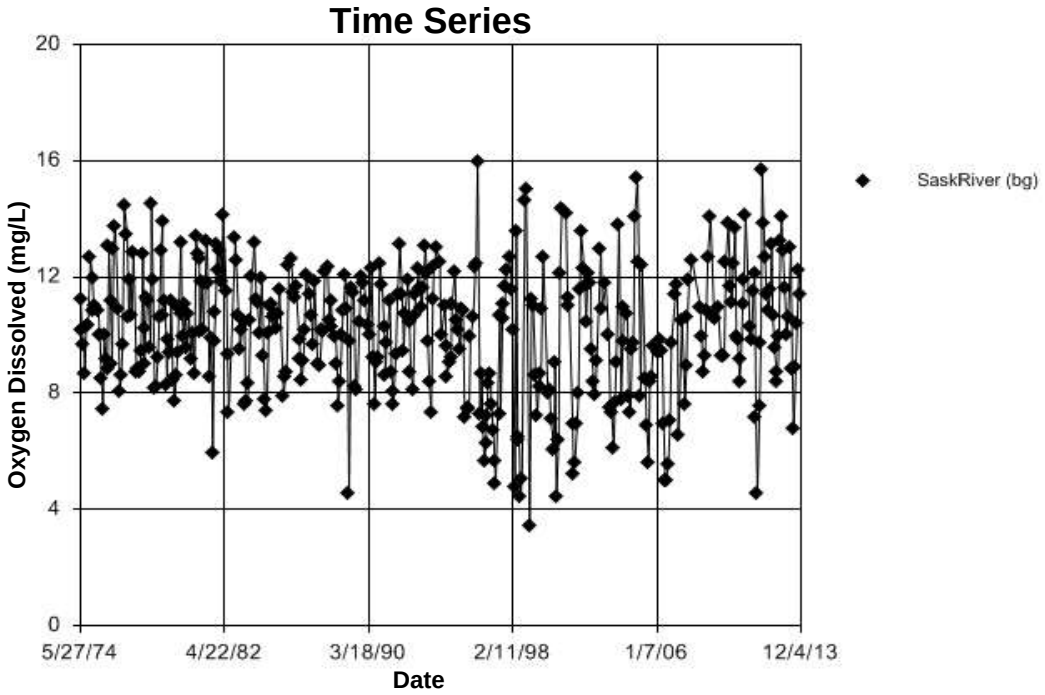


Figure D133 Saskatchewan River: Oxygen Dissolved

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 49.05
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 42 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 49.05
Adjusted Kruskal-Wallis statistic (H') = 49.05

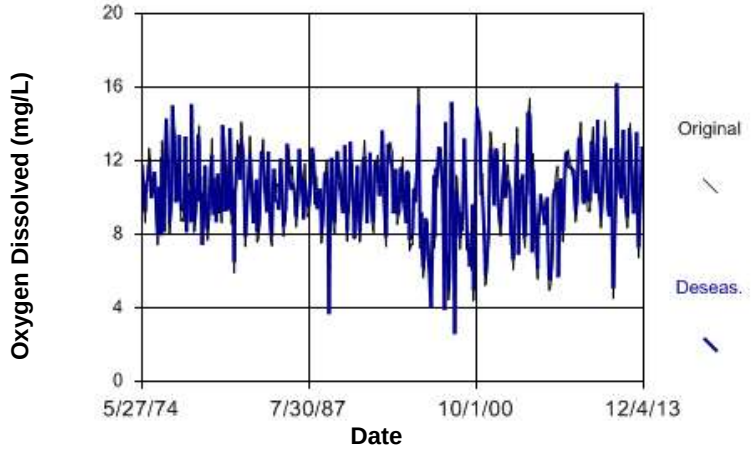


Figure D134 Saskatchewan River: Oxygen Dissolved

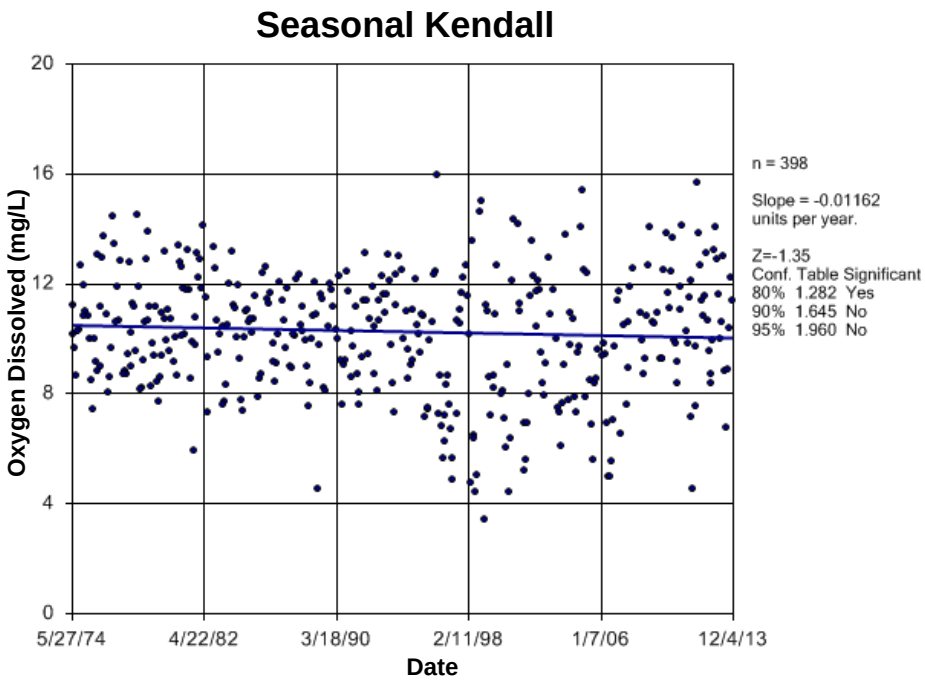


Figure D135 Saskatchewan River: Oxygen Dissolved

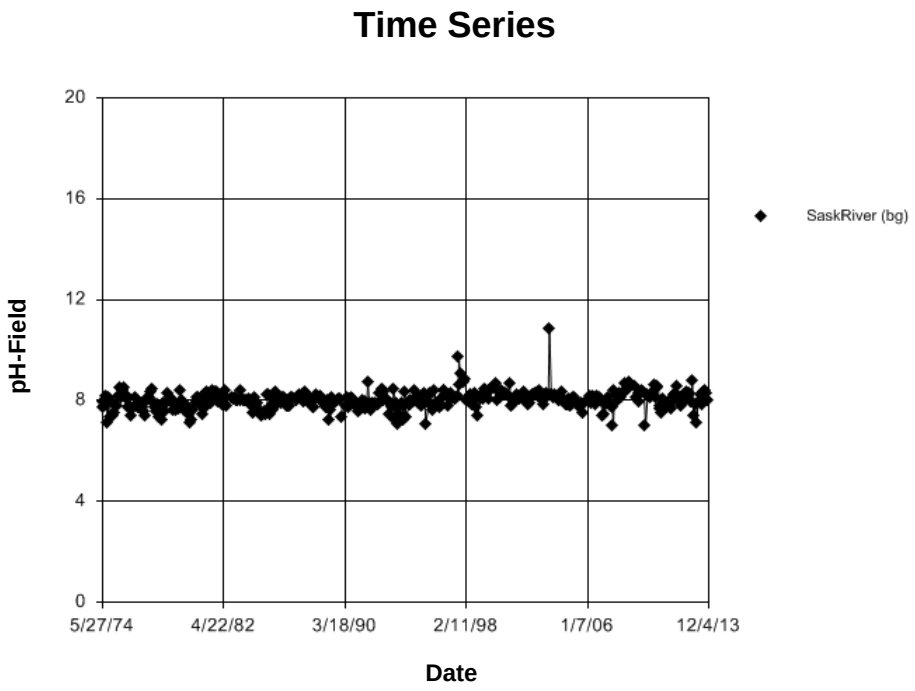


Figure D136 Saskatchewan River: pH-Field

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 16.63
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 64 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 16.63
Adjusted Kruskal-Wallis statistic (H') = 16.63

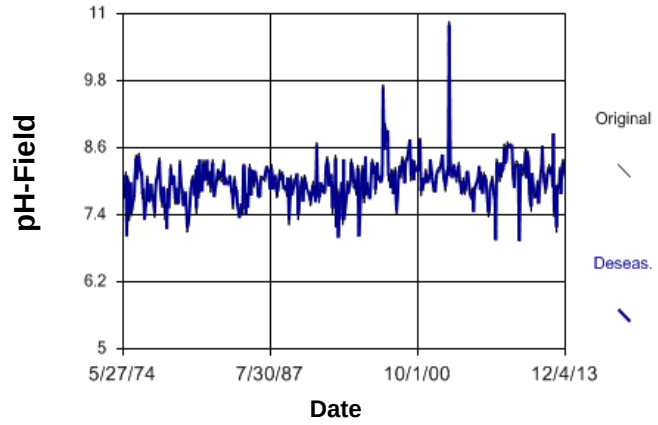


Figure D137 Saskatchewan River: pH-Field

Seasonal Kendall

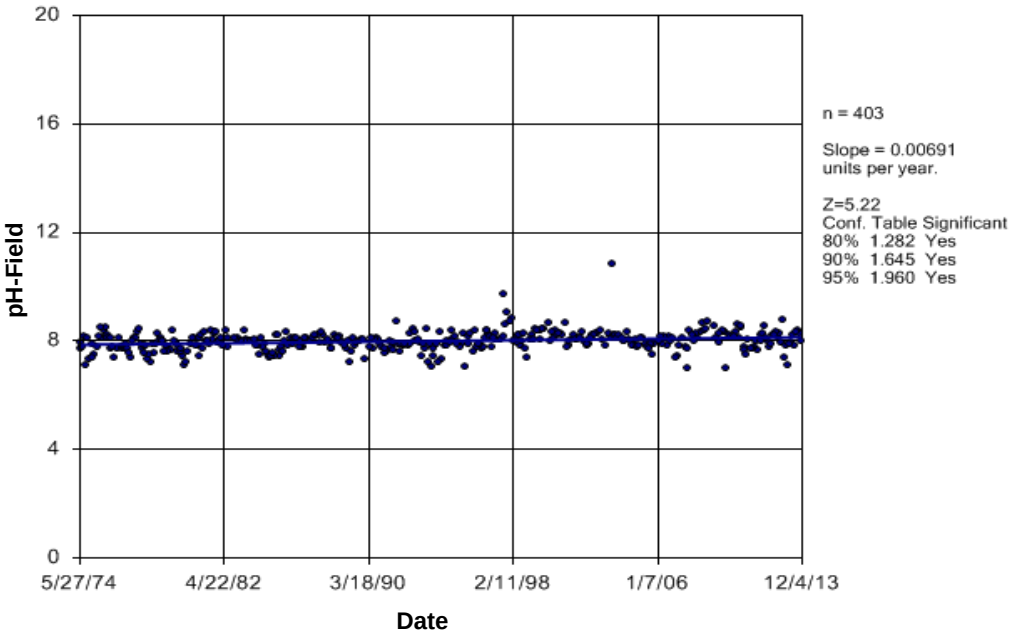


Figure D138 Saskatchewan River: pH-Field

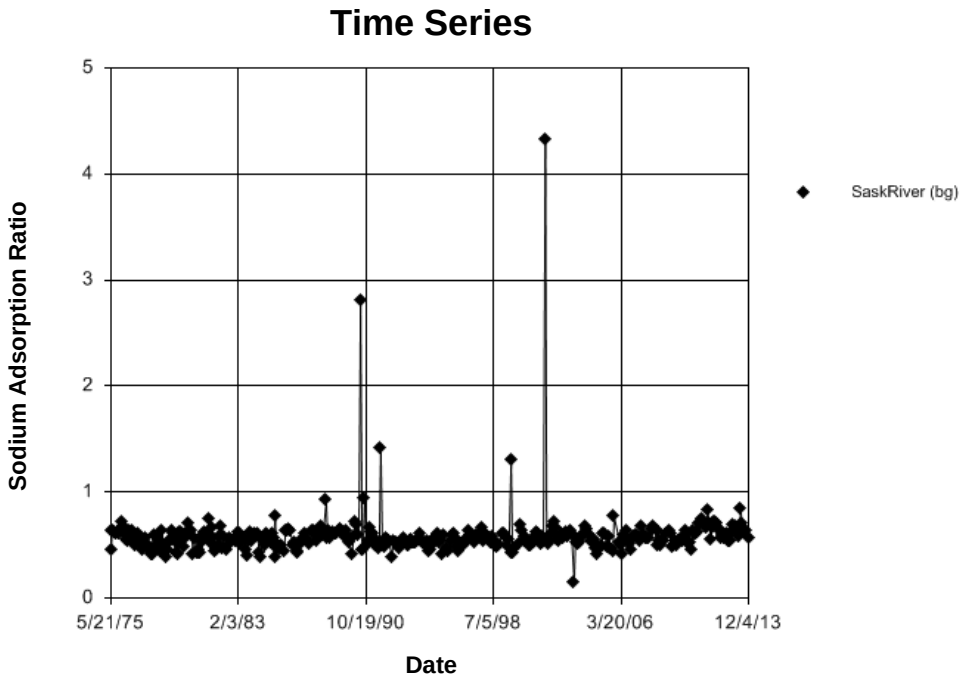


Figure D139 Saskatchewan River: Sodium Absorption Ratio

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 48.43
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 58 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 48.43
Adjusted Kruskal-Wallis statistic (H') = 48.43

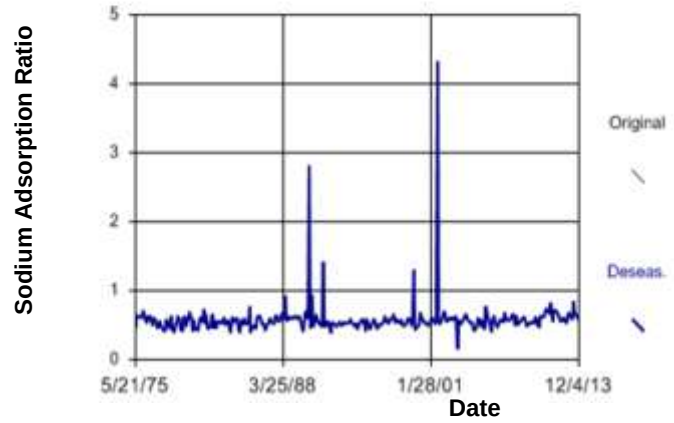


Figure D140 Saskatchewan River: Sodium Adsorption Ratio

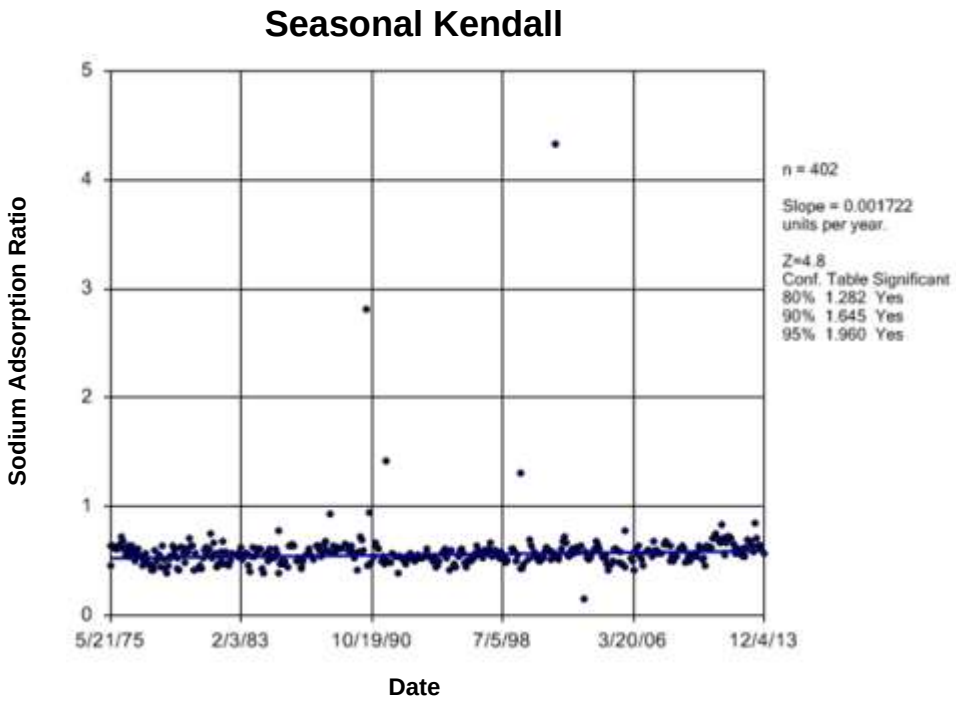


Figure D141 Saskatchewan River: Sodium Adsorption Ratio

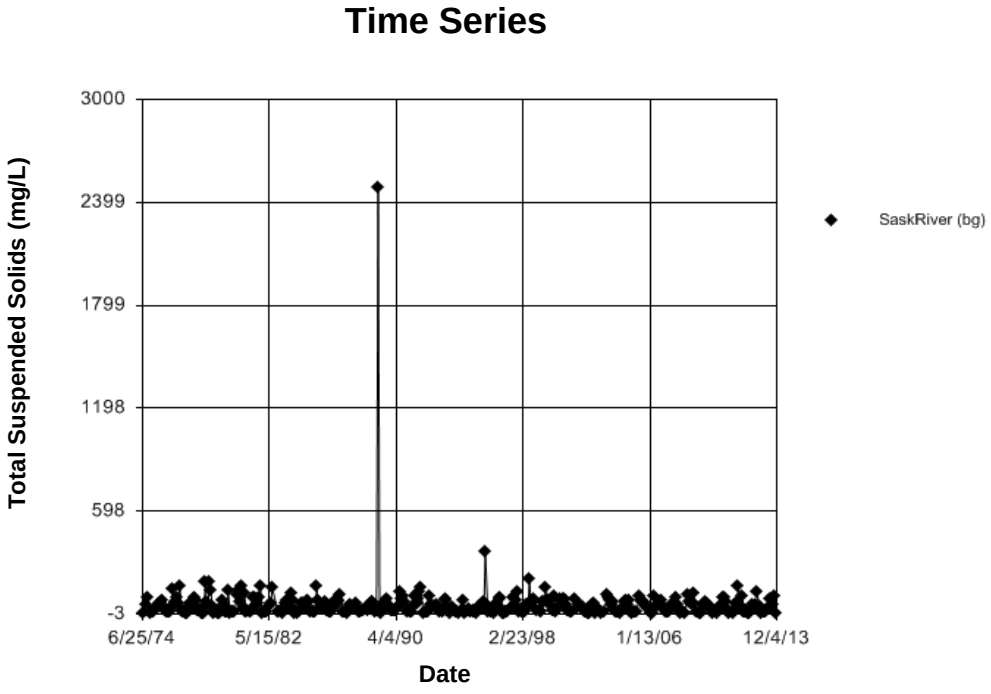


Figure D142 Saskatchewan River: Total Suspended Solids

Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 221.1
Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 221.1
Adjusted Kruskal-Wallis statistic (H') = 221.1

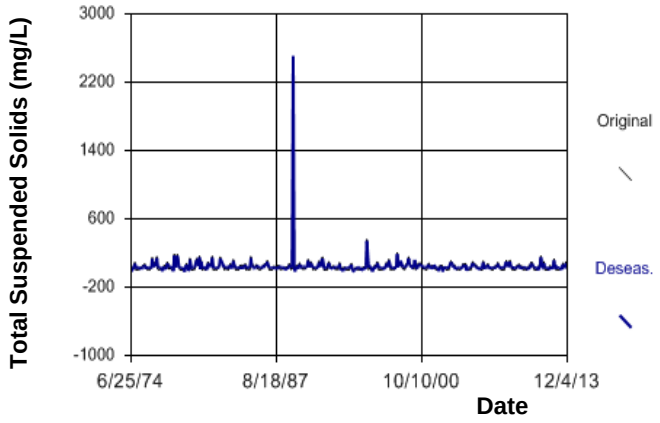


Figure D143 Saskatchewan River: Total Suspended Solids

Seasonal Kendall

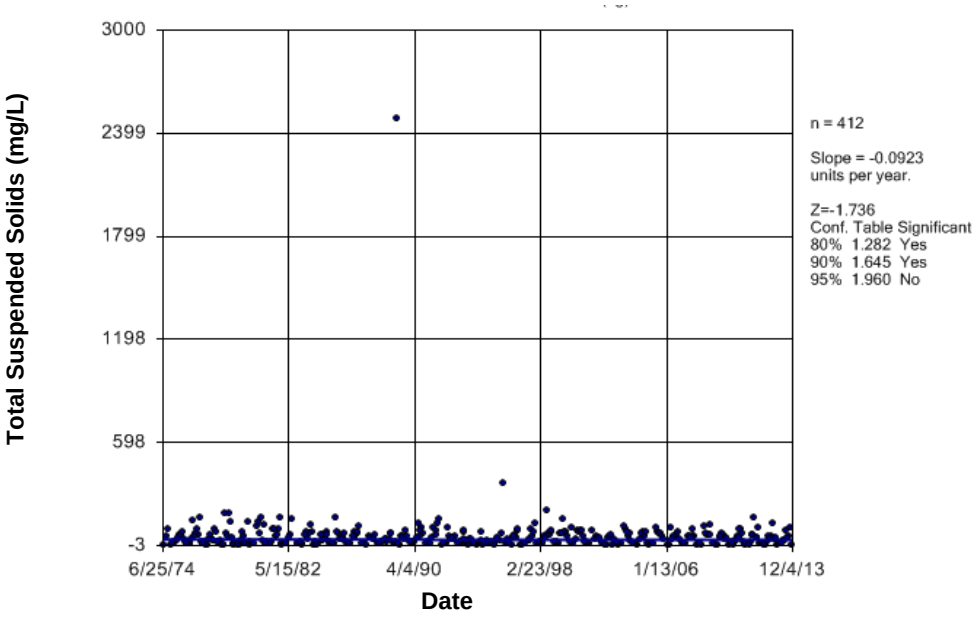


Figure D144 Saskatchewan River: Total Suspended Solids

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