

Seasonal Variations in the Limnology of Noell Lake in the Western Canadian Arctic Tracked by In Situ Observation Systems

Benjamin Paquette-Struger,^{1,2} Frederick J. Wrona,¹ David Atkinson¹ and Peter Di Cenzo³

APPENDIX 1

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TABLE S5. Chemical and nutrient analyses of water samples removed from various locations and depths of Noell Lake on 15 July 2013.

¹ Department of Geography, University of Victoria, PO Box 1700, Station CSC, Victoria, British Columbia V8W 2Y2, Canada

² Corresponding author: baps@uvic.ca

³ Water & Climate Impacts Research Centre, Environment Canada, University of Victoria, PO Box 3060, Station CSC, Victoria, British Columbia V8V 3R4

TABLE S1. Chemical and nutrient analyses of water samples removed from various locations and depths of Noell Lake on 17 September 2011.

Chemical analysis:																	
Sample location	Spec. cond.	pH	Alk.	F	Cl	SO ₄	Colour	DOC	DIC	Hard.	Ca	Mg	Na	K	NO ₂	SiO ₂	Turb.
Site 3	74.0	7.38	17.3	0.07	1.77	11.7	4.1	5.4	4.5	26.9	7.21	2.17	2.46	1.07	0.002	0.25	0.30
Site 4	72.4	7.49	17.9	0.07	1.76	11.7	4.3	5.3	4.3	26.6	7.12	2.15	2.48	1.07	0.002	0.25	0.36
Site 13	72.1	7.46	18.0	0.07	1.77	11.7	4.1	5.5	4.3	26.1	6.94	2.15	2.49	1.07	0.002	0.25	0.27
Site 19	72.2	7.45	18.1	0.07	1.77	11.7	4.1	5.4	4.2	26.5	7.04	2.16	2.52	1.06	0.002	0.25	0.30
Site 25	71.8	7.47	18.0	0.07	1.78	11.7	4.2	5.4	4.4	26.6	7.06	2.19	2.49	1.07	0.002	0.24	0.26
Site 27	72.2	7.40	17.3	0.07	1.77	11.7	3.9	5.3	4.5	25.9	6.86	2.13	2.49	1.07	0.002	0.23	26.70
Near Buoy 3 m	73.3	7.53	16.4	0.07	1.77	11.7	4.2	5.3	4.3	26.5	7.08	2.15	2.51	1.06	0.002	0.23	0.36
Near Buoy 4.5 m	73.0	7.50	17.8	0.07	1.77	11.7	4.2	5.4	4.3	26.9	7.22	2.16	2.49	1.07	0.003	0.23	0.33
Near Buoy 8 m	59.7	7.24	12.9	0.06	1.39	8.8	40.7	14.0	3.0	24.0	6.32	1.99	1.60	0.85	0.004	0.01	1.41
Mean	71.19	7.44	17.08	0.069	1.73	11.38	8.20	6.33	4.20	26.22	6.98	2.14	2.39	1.040	0.002	0.216	3.36
Max.	74.00	7.53	18.10	0.070	1.78	11.70	40.70	14.00	4.50	26.90	7.22	2.19	2.52	1.070	0.004	0.25	26.70
Min.	59.70	7.24	12.90	0.060	1.39	8.80	3.90	5.30	3.00	24.00	6.32	1.99	1.60	0.85	0.002	0.01	0.26
SD	4.36	0.087	1.66	0.003	0.13	0.96	12.19	2.88	0.46	0.90	0.27	0.058	0.30	0.073	0.001	0.078	8.76
Nutrient analysis:																	
Sample location	DP	NH ₃	NO ₃ NO ₂	OP	POC	PON	TN	TP	TDN	Turb.	Colour						
Site 3	0.0020	0.0060	0.001	0.0003	0.13	0.030	0.258	0.0076	0.209	0.4	—						
Site 4	0.0025	0.011	0.001	0.0002	0.18	0.035	0.241	0.0051	0.228	0.4	—						
Site 13	0.0020	0.0025	0.001	0.0001	0.136	0.035	0.265	0.0062	0.218	0.5	—						
Site 19	0.0023	0.0025	0.001	0.0001	0.096	0.036	0.243	0.0050	0.220	0.3	—						
Site 25	0.0020	0.0060	0.001	0.0002	0.122	0.029	0.259	0.0044	0.207	0.6	—						
Site 27	0.0031	0.0050	0.001	0.0003	6.48	0.757	0.732	0.060	0.208	11.0	—						
Near Buoy 3 m	0.0021	0.0070	0.001	0.0002	0.133	0.021	0.257	0.0058	0.216	0.5	—						
Near Buoy 4.5 m	0.0029	0.0050	0.001	0.0002	0.276	0.036	0.265	0.0067	0.252	0.6	—						
Near Buoy 8 m	0.0052	0.0050	0.001	0.0007	0.271	0.048	0.438	0.012	0.378	1.7	—						
Mean	0.0027	0.0056	0.001	0.00026	0.869	0.114	0.329	0.0125	0.237	1.78	—						
Max.	0.0052	0.011	0.001	0.00070	6.48	0.757	0.732	0.0596	0.378	11.00	—						
Min.	0.0020	0.0025	0.001	0.00010	0.096	0.0210	0.241	0.00440	0.207	0.30	—						
SD	0.0010	0.0025	0.0	0.00018	2.105	0.241	0.163	0.0178	0.0545	3.48	—						

TABLE S2. Chemical and nutrient analyses of water samples removed from various locations and depths of Noell Lake on 13 May 2012.

Chemical analysis:																	
Sample location	Spec. cond.	pH	Alk.	F	Cl	SO ₄	Colour	DOC	DIC	Hard.	Ca	Mg	Na	K	NO ₂	SiO ₂	Turb.
Site 3	83.1	7.40	20.1	0.07	1.99	13.1	4.5	6.1	5.1	30.6	8.19	2.46	2.84	1.14	0.001	0.26	—
Site 4	83.5	7.35	19.8	0.08	2.06	13.7	4.2	6.1	5.2	30.6	8.18	2.46	2.82	1.14	0.001	0.31	—
Site 13	95.7	7.39	23.8	0.09	2.40	15.9	4.8	6.8	6.4	35.2	9.42	2.84	3.27	1.33	0.002	0.45	—
Site 19	87.4	7.43	21.6	0.07	1.93	12.4	4.7	6.4	5.4	31.5	8.36	2.57	2.91	1.18	0.001	0.30	—
Site 25	88.1	7.30	21.3	0.08	2.15	14.4	4.4	6.4	5.5	31.8	8.49	2.57	2.94	1.18	0.001	0.29	—
Site 27	88.5	7.27	21.0	0.08	2.17	14.3	4.6	6.6	5.5	32.4	8.62	2.63	2.98	1.21	0.001	0.28	—
Near Buoy 3 m	87.5	7.22	21.1	0.08	2.09	13.6	4.3	6.5	5.5	31.9	8.50	2.59	2.94	1.20	0.001	0.33	—
Near Buoy 4.5 m	89.9	7.06	22.6	0.08	2.22	14.4	4.2	5.9	6.7	32.3	8.65	2.61	2.96	1.21	0.002	0.77	—
Near Buoy 8 m	101.0	7.28	24.8	0.09	2.50	16.5	5.6	7.2	6.3	36.6	9.71	3.00	3.44	1.33	0.002	0.32	—
Mean	89.40	7.30	21.79	0.08	2.17	14.26	4.59	6.44	5.73	32.54	8.68	2.64	3.01	1.21	0.001	0.368	—
Max.	101.0	7.43	24.80	0.09	2.50	16.50	5.60	7.20	6.70	36.60	9.71	3.00	3.44	1.33	0.002	0.770	—
Min.	83.10	7.06	19.80	0.07	1.93	12.40	4.20	5.90	5.10	30.60	8.18	2.46	2.82	1.14	0.001	0.260	—
SD	5.70	0.087	1.66	0.007	0.18	1.29	0.43	0.40	0.58	2.037	0.53	0.18	0.21	0.071	0.001	0.160	—
Nutrient analysis:																	
Sample location	DP	NH ₃	NO ₃ NO ₂	OP	POC	PON	TN	TP	TDN	Turb.	Colour						
Site 3	0.0037	0.0060	0.0217	0.0016	0.066	0.0050	0.242	0.0055	0.240	0.40	—						
Site 4	0.0026	0.016	0.0281	0.0010	0.020	0.0050	0.274	0.0041	0.238	0.10	—						
Site 13	0.0023	0.0080	0.0212	0.00070	0.062	0.014	0.264	0.0041	0.252	0.10	—						
Site 19	0.0032	0.0080	0.0224	0.0014	0.044	0.010	0.239	0.0052	0.238	0.10	—						
Site 25	0.0024	0.017	0.0215	0.00070	0.050	0.0050	0.252	0.0050	0.246	0.10	—						
Site 27	0.0021	0.0060	0.0253	0.00050	0.059	0.011	0.274	0.0045	0.261	0.10	—						
Near Buoy 3 m	0.0032	0.0060	0.0275	0.0014	0.053	0.0050	0.241	0.0041	0.240	0.090	—						
Near Buoy 4.5 m	0.0019	0.0060	0.0661	0.00070	0.056	0.0050	0.264	0.0036	0.260	0.20	—						
Near Buoy 8 m	0.0025	0.015	0.0275	0.00080	0.049	0.0050	0.282	0.0041	0.283	0.10	—						
Mean	0.0027	0.0098	0.0290	0.00098	0.051	0.0072	0.259	0.0045	0.251	0.14	—						
Max.	0.0037	0.017	0.0661	0.0016	0.066	0.014	0.282	0.0052	0.283	0.40	—						
Min.	0.0019	0.0060	0.0212	0.00050	0.020	0.0050	0.239	0.0036	0.238	0.090	—						
SD	0.00059	0.0048	0.0142	0.00039	0.013	0.0035	0.0162	0.00063	0.015	0.10	—						

TABLE S3. Chemical analyses of water samples removed from various locations and depths of Noell Lake on 26 June 2012.

Sample location	Spec. cond.	pH	Alk.	F	Cl	SO ₄	Colour	DOC	DIC	Hard.	Ca	Mg	Na	K	NO ₂	SiO ₂	Turb.
Site 3	69.9	7.12	17.2	0.06	1.77	10.9	0.25	—	—	25.7	6.79	2.13	2.43	1.06	—	0.36	—
Site 4	69.6	7.14	17.1	0.06	1.77	10.9	8.70	—	—	25.7	6.77	2.13	2.43	1.05	—	0.36	—
Site 13	71.8	7.23	17.7	0.07	1.81	11.2	7.50	—	—	26.5	6.98	2.20	2.51	1.07	—	0.36	—
Site 19	70.8	7.21	17.2	0.06	1.78	11.0	8.00	—	—	26.0	6.84	2.16	2.47	1.07	—	0.35	—
Site 25	71.9	7.28	17.5	0.06	1.80	11.2	7.40	—	—	26.6	7.03	2.20	2.51	1.08	—	0.36	—
Site 27	71.7	7.22	17.1	0.06	1.81	11.3	7.50	—	—	26.7	7.04	2.21	2.51	1.08	—	0.35	—
Near Buoy 3 m	71.0	7.23	16.8	0.07	1.80	11.2	8.10	—	—	26.3	6.94	2.17	2.48	1.07	—	0.36	—
Near Buoy 4.5 m	70.9	7.18	17.0	0.06	1.80	11.1	8.20	—	—	26.3	6.96	2.18	2.49	1.07	—	0.36	—
Near Buoy 8 m	72.7	7.11	17.2	0.07	1.81	11.3	7.70	—	—	26.9	7.09	2.22	2.55	1.09	—	0.37	—
Mean	71.14	7.19	17.20	0.063	1.79	11.12	7.04	—	—	26.30	6.94	2.18	2.49	1.07	—	0.36	—
Max.	72.70	7.28	17.50	0.070	1.81	11.30	8.70	—	—	26.90	7.09	2.22	2.55	1.09	—	0.37	—
Min.	69.60	7.11	16.80	0.060	1.77	10.90	0.25	—	—	25.70	6.77	2.13	2.43	1.05	—	0.35	—
S.D.	0.99	0.057	0.26	0.005	0.02	0.16	2.58	—	—	0.43	0.11	0.033	0.039	0.01	—	0.006	—

TABLE S4. Chemical and nutrient analyses of water samples removed from various locations and depths of Noell Lake on 19 November 2012.

Chemical analysis:																	
Sample location	Spec. cond.	pH	Alk.	F	Cl	SO ₄	Colour	DOC	DIC	Hard.	Ca	Mg	Na	K	NO ₂	SiO ₂	Turb.
Site 3	84.5	7.22	19.6	0.05	2.91	12.7	5.2	-	4.5	29.1	7.59	2.47	3.26	1.15	-	0.24	-
Site 4	76.7	7.21	18.1	0.05	1.89	12.1	4.9	-	4.3	27.6	7.23	2.31	2.67	1.11	-	0.22	-
Site 13	76.7	7.21	18.3	0.05	1.91	12.2	4.9	-	4.3	27.5	7.21	2.31	2.65	1.11	-	0.22	-
Site 19	76.5	7.25	19.0	0.05	1.89	12.2	4.9	-	4.2	27.7	7.29	2.31	2.70	1.11	-	0.22	-
Site 25	82.2	7.23	19.8	0.05	2.04	13.2	5.4	-	4.5	30.6	8.14	2.49	2.88	1.20	-	0.24	-
Site 27	78.0	7.21	19.0	0.05	1.99	12.6	5.1	-	4.3	28.1	7.35	2.37	2.74	1.17	-	0.22	-
Near Buoy 3 m	78.7	7.23	19.1	0.05	1.96	12.8	5.0	-	4.3	27.8	7.26	2.35	2.70	1.15	-	0.23	-
Near Buoy 4.5 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Near Buoy 8 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	79.04	7.22	18.99	0.05	2.08	12.54	5.057	-	4.34	28.34	7.44	2.37	2.80	1.14	-	0.23	-
Max.	84.5	7.25	19.80	0.05	2.91	13.20	5.40	-	4.50	30.60	8.14	2.49	3.26	1.20	-	0.24	-
Min.	76.5	7.21	18.11	0.05	1.89	12.10	4.90	-	4.20	27.50	7.21	2.31	2.65	1.11	-	0.22	-
SD	3.12	0.015	0.62	0.0	0.37	0.40	0.19	-	0.11	1.13	0.34	0.077	0.22	0.035	-	0.009	-
Nutrient analysis:																	
Sample location	DP	NH ₃	NO ₃ NO ₂	OP	POC	PON	TN	TP	TDN	Turb.	Colour						
Site 3	0.0020	0.0025	0.001	0.0001	-	-	0.232	0.0044	0.192	0.4	0.25						
Site 4	0.0019	0.0025	0.003	0.0001	-	-	0.214	0.0049	0.214	0.4	0.25						
Site 13	0.0019	0.0060	0.003	0.0001	-	-	0.213	0.0044	0.197	0.3	0.25						
Site 19	0.0020	0.0060	0.004	0.0002	-	-	0.214	0.0049	0.197	0.3	0.25						
Site 25	0.0019	0.0060	0.001	0.0003	-	-	0.232	0.0047	0.227	0.4	0.25						
Site 27	0.0025	0.0070	0.003	0.0003	-	-	0.224	0.0051	0.197	0.4	0.25						
Near Buoy 3 m	0.0018	0.0025	0.002	0.0001	-	-	0.212	0.0047	0.193	0.4	0.25						
Near Buoy 4.5 m	-	-	-	-	-	-	-	-	-	-	-						
Near Buoy 8 m	-	-	-	-	-	-	-	-	-	-	-						
Mean	0.0020	0.0046	0.0024	0.00017	-	-	0.22	0.0047	0.202	0.37	0.25						
Max.	0.0025	0.0070	0.0040	0.00030	-	-	0.23	0.0051	0.227	0.40	0.25						
Min.	0.0018	0.0025	0.0010	0.00010	-	-	0.21	0.0044	0.192	0.30	0.25						
SD	0.00023	0.0020	0.0011	0.000095	-	-	0.0090	0.00026	0.0131	0.049	0.0						

TABLE S5. Chemical and nutrient analyses of water samples removed from various locations and depths of Noell Lake on 15 July 2013.

Chemical analysis:																	
Sample location	Spec. cond.	pH	Alk.	F	Cl	SO ₄	Colour	DOC	DIC	Hard.	Ca	Mg	Na	K	NO ₂	SiO ₂	Turb.
Site 3	71.2	7.31	17.1	0.07	1.79	11.2	9.1	5.8	4.2	27.1	7.36	2.11	2.49	1.06	0.001	0.58	–
Site 4	70.8	7.30	17.1	0.07	1.80	11.2	8.8	5.6	4.1	26.9	7.30	2.10	2.50	1.06	<0.001	0.59	–
Site 13	70.6	7.33	16.5	0.07	1.80	11.3	9.2	5.7	4.2	27.0	7.35	2.09	2.47	1.05	<0.001	0.62	–
Site 19	71.0	7.31	16.3	0.07	1.80	11.3	8.9	5.7	4.1	26.4	7.11	2.11	2.55	1.08	<0.001	0.59	–
Site 25	70.5	7.34	17.0	0.07	1.80	11.3	9.3	5.7	4.1	26.7	7.19	2.12	2.52	1.08	0.001	0.59	–
Site 27	70.7	7.33	16.9	0.07	1.79	11.2	9.5	5.8	4.1	26.6	7.14	2.14	2.55	1.10	0.001	0.60	–
Near Buoy 3 m	71.0	7.34	17.2	0.07	1.80	11.3	9.2	5.6	4.1	27.0	7.27	2.14	2.50	1.08	0.001	0.59	–
Near Buoy 4.5 m	70.8	7.30	16.8	0.07	1.80	11.3	9.3	5.7	4.0	27.0	7.31	2.14	2.47	1.07	<0.001	0.64	–
Near Buoy 8 m	71.1	7.33	16.7	0.07	1.79	11.2	9.2	5.7	4.1	27.2	7.40	2.11	2.42	1.04	<0.001	0.61	–
Mean	70.86	7.32	16.84	0.07	1.80	11.26	9.16	5.7	4.11	26.88	7.27	2.12	2.50	1.07	<0.001	0.60	–
Max.	71.20	7.34	17.20	0.07	1.80	11.30	9.50	5.8	4.20	27.20	7.40	2.14	2.55	1.1	0.001	0.64	–
Min.	70.50	7.30	16.30	0.07	1.79	11.20	8.80	5.6	4.00	26.40	7.11	2.09	2.42	1.04	<0.001	0.58	–
SD	0.23	0.016	0.30	0.0	0.01	0.053	0.21	0.071	0.060	0.26	0.10	0.019	0.041	0.02	–	0.019	–
Nutrient analysis:																	
Sample location	DP	NH ₃	NO ₃ NO ₂	OP	POC	PON	TN	TP	TDN	Turb.	Colour						
Site 3	0.0023	0.0049	0.001	0.0003	0.20	0.031	0.245	0.0071	0.204	1.3	8.0						
Site 4	0.0022	0.0060	0.001	0.0002	0.15	0.026	0.284	0.0073	0.242	1.5	8.0						
Site 13	0.0026	0.010	0.001	0.0003	0.22	0.035	0.253	0.0078	0.204	2.0	8.0						
Site 19	0.0024	0.0060	0.001	0.0002	0.23	0.043	0.241	0.0098	0.206	1.9	8.0						
Site 25	0.0021	0.0049	0.001	0.0002	0.17	0.031	0.275	0.0066	0.219	1.6	8.0						
Site 27	0.0027	0.031	0.001	0.0003	0.17	0.025	0.240	0.012	0.199	1.6	8.0						
Near Buoy 3 m	0.0020	0.0080	0.001	0.0002	0.16	0.024	0.232	0.0091	0.196	1.6	8.0						
Near Buoy 4.5 m	0.0022	0.020	0.001	0.0002	0.19	0.031	0.241	0.010	0.201	1.9	8.0						
Near Buoy 8 m	0.0022	0.025	0.001	0.0002	0.21	0.030	0.246	0.0075	0.237	1.9	8.0						
Mean	0.0023	0.0129	0.001	0.00023	0.190	0.0307	0.251	0.00861	0.212	1.7	8.0						
Max.	0.0027	0.0310	0.001	0.0003	0.229	0.0430	0.284	0.0123	0.242	2.0	8.0						
Min.	0.0020	0.00490	0.001	0.0002	0.153	0.0240	0.232	0.00660	0.196	1.3	8.0						
SD	0.00023	0.00987	0.0	0.00005	0.0285	0.00581	0.0174	0.00184	0.0169	0.235	0.0						