Accessory publication

Biogeochemistry and cyanobacterial blooms: investigating the relationship in a shallow, polymictic, temperate lake

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Table A1. Peeper profile data

Notes: depth refers to depth into the sediment; '0' refers to the sediment-water interface. All measurements above the SWI have been pooled. All reported uncertainties are one standard deviation. Most analytes report results from at least 3 peepers. Limits of detection for NH_4^+, NO_x and FRP were 0.1, 0.1 and 0.03 μM respectively. Concentrations less than this are reported as "<LoD". For (g) and (h), no uncertainties are provided, only 1 sample was analysed

(a) NH_4^+

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	21 ± 3	2.2 ± 0.5	1.6 ± 0.5	0.8 ± 0.4	1.4 ± 0.6	1.3 ± 0.8
0	25 ± 16	17 ± 11	15 ± 6	4.5 ± 0.6	9 ± 1	3 ± 1
1	24 ± 14	25 ± 1	25 ± 6	8 ± 7	10 ± 3	5 ± 3
2	25 ± 15	29 ± 7	31 ± 6	10 ± 9	12 ± 6	6.6 ± 0.0
3	27 ± 14	31 ± 10	35 ± 10	13 ± 9	13 ± 6	7 ± 2
4	28 ± 20	33 ± 12	31 ± 5	18 ± 10	17 ± 4	11 ± 4
5	32 ± 20	36 ± 16	33 ± 8	23 ± 13	19 ± 4	15 ± 4
6	33 ± 24	38 ± 20	30 ± 7	31 ± 15	23 ± 11	19 ± 2
7	33 ± 24	39 ± 22	31 ± 5	42 ± 26	31 ± 12	27 ± 9
8	40 ± 30	39 ± 25	33 ± 9	48 ± 27	37 ± 12	33 ± 14
9	41 ± 31	43 ± 29	33 ± 4	57 ± 37	46 ± 19	40 ± 6
10	46 ± 35	48 ± 35	32 ± 3	69 ± 38	48 ± 20	43 ± 10
11	62 ± 59	54 ± 40	32 ± 1	73 ± 32	59 ± 23	48 ± 11
12	57 ± 43	52 ± 32	30 ± 4	85 ± 44	63 ± 22	55 ± 19
13	59 ± 40	50 ± 26	31 ± 9	75 ± 21	73 ± 22	57 ± 25
14	66 ± 47	46 ± 16	31 ± 10	92 ± 49	76 ± 23	60 ± 26

Table A1. (*Cont.*)

(b) FRP

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	9 ± 2	0.6 ± 0.1	3 ± 1	1.7 ± 0.6	0.4 ± 0.1	0.4 ± 0.1
0	6 ± 2	9 ± 3	43 ± 13	6 ± 1	8.2 ± 0.8	5 ± 6
1	5.9 ± 0.7	20 ± 9	68 ± 6	7 ± 2	13.9 ± 0.5	8 ± 11
2	5.5 ± 0.4	21 ± 9	68 ± 15	10 ± 3	12 ± 3	14 ± 5
3	6.8 ± 0.1	19 ± 9	54 ± 14	11 ± 7	16 ± 2	11 ± 11
4	7 ± 1	19 ± 11	32 ± 24	10 ± 5	14 ± 5	27 ± 11
5	6 ± 1	18 ± 9	40 ± 14	13 ± 7	14 ± 5	11 ± 12
6	6 ± 1	18 ± 12	34 ± 12	11 ± 5	12 ± 3	15 ± 15
7	7 ± 3	18 ± 14	33 ± 13	12 ± 3	12 ± 4	16 ± 14
8	8 ± 3	16 ± 14	37 ± 18	14 ± 2	13 ± 1	19 ± 19
9	7 ± 3	17 ± 17	30 ± 14	16 ± 2	16 ± 2	21 ± 10
10	10 ± 3	20 ± 20	24 ± 8	18 ± 4	14 ± 3	25 ± 10
11	9 ± 4	22 ± 21	22 ± 8	18 ± 5	19 ± 4	24 ± 14
12	11 ± 4	20 ± 18	20 ± 4	21 ± 4	20 ± 4	23 ± 12
13	12 ± 4	16 ± 12	28 ± 12	16 ± 7	20 ± 5	8 ± 8
14	11 ± 3	12 ± 5	17 ± 3	21 ± 4	19 ± 3	29 ± 10

(c) NO_x

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	<LoD	5.1 ± 0.2	5 ± 5	0.4 ± 0.3	3.4 ± 0.9	4 ± 3
0	<LoD	0.6 ± 0.6	<LoD	0.1 ± 0.1	<LoD	1 ± 1
1	<LoD	0.6 ± 0.6	<LoD	<LoD	<LoD	1 ± 1
2	<LoD	0.6 ± 0.6	0.1 ± 0.1	<LoD	0.1 ± 0.1	0.9 ± 0.9
3	<LoD	0.6 ± 0.6	<LoD	<LoD	<LoD	0.1 ± 0.1
4	<LoD	0.6 ± 0.6	<LoD	<LoD	<LoD	0.3 ± 0.3
5	<LoD	0.6 ± 0.6	0.1 ± 0.1	<LoD	<LoD	<LoD
6	<LoD	0.6 ± 0.6	<LoD	<LoD	0.1 ± 0.1	0.1 ± 0.1
7	<LoD	0.6 ± 0.6	<LoD	<LoD	0.1 ± 0.1	<LoD
8	<LoD	0.6 ± 0.6	0.3 ± 0.3	<LoD	0.1 ± 0.1	0.2 ± 0.2
9	<LoD	0.4 ± 0.4	<LoD	<LoD	0.1 ± 0.1	0.1 ± 0.1
10	<LoD	0.6 ± 0.6	<LoD	<LoD	0.1 ± 0.1	0.2 ± 0.2
11	<LoD	0.6 ± 0.6	<LoD	<LoD	0.2 ± 0.2	<LoD
12	<LoD	0.6 ± 0.6	<LoD	<LoD	0.2 ± 0.2	0.3 ± 0.3
13	<LoD	0.6 ± 0.6	<LoD	<LoD	0.2 ± 0.2	1.0 ± 1.0
14	<LoD	0.5 ± 0.5	0.4 ± 0.4	<LoD	0.3 ± 0.3	0.2 ± 0.2

Table A1. (*Cont.*)

(d) Fe(II) (as Fe^{2+})

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	4 ± 1	0.7 ± 0.1	0.9 ± 0.4	4 ± 1	0.8 ± 0.3	1.0 ± 0.4
0	5 ± 3	4.9 ± 0.3	8.5 ± 0.9	7 ± 4	11 ± 1	12 ± 16
1	6 ± 5	7 ± 4	12 ± 1	7 ± 3	13.3 ± 0.3	12 ± 16
2	8 ± 7	7 ± 4	11 ± 2	11 ± 8	16.0 ± 0.3	33 ± 13
3	10 ± 9	6 ± 3	13 ± 6	10 ± 8	16.3 ± 0.3	25 ± 2
4	11 ± 10	6 ± 3	9 ± 1	15 ± 16	13 ± 3	21 ± 2
5	12 ± 9	6 ± 3	10 ± 2	8 ± 6	11 ± 2	21.4 ± 0.6
6	15 ± 10	6 ± 2	9 ± 1	7 ± 4	12 ± 3	26 ± 8
7	17 ± 9	6 ± 2	10.1 ± 0.3	6 ± 2	12 ± 5	23 ± 8
8	19 ± 8	7 ± 3	12.7 ± 0.3	7 ± 3	12 ± 5	27 ± 9
9	20 ± 7	8 ± 3	12 ± 2	9 ± 5	13 ± 4	27 ± 9
10	23 ± 10	9 ± 2	11 ± 4	10 ± 7	13 ± 2	27.3 ± 0.8
11	19 ± 4	11 ± 1	12 ± 6	12 ± 7	15 ± 2	36 ± 4
12	20 ± 4	13.1 ± 0.6	13 ± 8	13 ± 10	17.0 ± 0.4	37 ± 3
13	21 ± 5	16 ± 2	16 ± 5	13 ± 10	18 ± 1	38.1 ± 0.3
14	23 ± 6	18 ± 1	17 ± 6	15 ± 10	19 ± 2	40 ± 3

(e) Sulfide

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	n/a	n/a	n/a	n/a	n/a	n/a
0	23 ± 17	11.2 ± 0.5	36 ± 12	2 ± 2	3.8 ± 0.2	2.9 ± 0.6
1	24 ± 8	10 ± 1	22.4 ± 0.2	4 ± 1	5.1 ± 0.8	3 ± 1
2	34 ± 6	9 ± 2	24 ± 1	6 ± 2	5 ± 1	3 ± 1
3	35 ± 23	8.7 ± 0.2	21 ± 7	4.0 ± 0.5	5 ± 2	4.8 ± 0.1
4	11 ± 12	10 ± 1	22 ± 2	2.4 ± 0.5	5 ± 3	3.5 ± 0.4
5	5 ± 3	10 ± 2	26.4 ± 0.8	4 ± 4	7 ± 5	4.2 ± 0.8
6	9 ± 3	11 ± 1	29 ± 2	2 ± 1	7 ± 3	4.5 ± 0.6
7	18 ± 10	10 ± 1	30 ± 3	2 ± 1	8 ± 4	4 ± 1
8	8.9 ± 0.9	11 ± 1	25 ± 7	1.9 ± 0.8	8 ± 4	5.2 ± 0.9
9	8.2 ± 0.3	11.5 ± 0.6	19 ± 4	2 ± 2	9 ± 2	3.4 ± 0.1
10	8 ± 4	10 ± 1	26 ± 3	2.8 ± 0.7	12 ± 4	4.2 ± 0.5
11	9.7 ± 0.0	8.4 ± 0.0	21 ± 4	1.0 ± 0.4	10 ± 2	4.4 ± 0.2
12	7 ± 2	7.5 ± 0.2	23 ± 4	0.8 ± 0.2	13 ± 1	6 ± 2
13	13 ± 2	8 ± 3	19 ± 5	4 ± 2	8 ± 3	4 ± 2
14	13 ± 14	8 ± 4	31 ± 10	5 ± 2	8 ± 4	5 ± 1

Table A1. (*Cont.*)

(f) Sulfate

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	6 ± 3	15 ± 2		18.9 ± 0.8	29	
0	4.0 ± 0.9	5 ± 2		43 ± 2	28 ± 4	
1	3.7 ± 0.3	3.2 ± 0.1		12 ± 6	22 ± 5	
2	3.1 ± 0.6	3.1 ± 0.1		9 ± 5	23 ± 2	
3	3 ± 1	3.5 ± 0.3		7 ± 3	20 ± 3	
4	3.0 ± 0.5	3.2 ± 0.2		5 ± 3	16 ± 9	
5	3.0 ± 0.5	3.2 ± 0.2		6 ± 3	9 ± 3	
6	2.9 ± 0.3	3.1 ± 0.0		4 ± 1	9 ± 4	
7	4 ± 1	3.2 ± 0.2		2.9 ± 0.2	3.1 ± 0.1	
8	3 ± 1	3.3 ± 0.0		2.9 ± 0.2	3.0 ± 0.4	
9	3.1 ± 0.6	3.2 ± 0.2		3.0 ± 0.0	3.4 ± 0.4	
10	2.8 ± 0.2	3.2 ± 0.1		3.0 ± 0.3	3.9 ± 0.9	
11	3 ± 1	3.1 ± 0.6		3.0 ± 0.1	3.4 ± 0.1	
12	4 ± 2	3.0 ± 0.5		3.1 ± 0.5	3.4 ± 0.3	
13	2.9 ± 0.4	3.6 ± 0.4		3.3 ± 0.3	4.3 ± 0.4	
14	2.7 ± 0.0	3.3 ± 0.2		3.5 ± 0.8	6 ± 4	

(g) Methane

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	0.88	0.52 ± 0.01			0.56	
0				0.48		
1	0.69	0.5 ± 0.1		0.61	0.56 ± 0.05	
3	0.60	0.6 ± 0.1		0.41	0.7 ± 0.1	
5	0.50	0.6 ± 0.1		0.54	0.56 ± 0.09	
7	0.36	0.5 ± 0.3		0.74	0.51 ± 0.00	
9	0.10	0.45 ± 0.06		0.65	0.5 ± 0.1	
11	0.63	0.40 ± 0.06		0.57	0.52 ± 0.06	
13		0.5 ± 0.1			0.65 ± 0.09	

(h) DOC

	LIB mean [analyte] (μM)			CLO mean [analyte] (μM)		
Depth (cm)	Mar	June	Sept	Mar	June	Sept
Water column	5 ± 6	1 ± 1		0.77	0.28	
0				0.57	0.46	
2	25	12		5.3	1.7	
4	37	13		9.4	1.8	
6	43	11		18	3.8	
8	17	13		25	8.8	
10	33	8.6		14	8.8	
12	28	9.2		40	15	

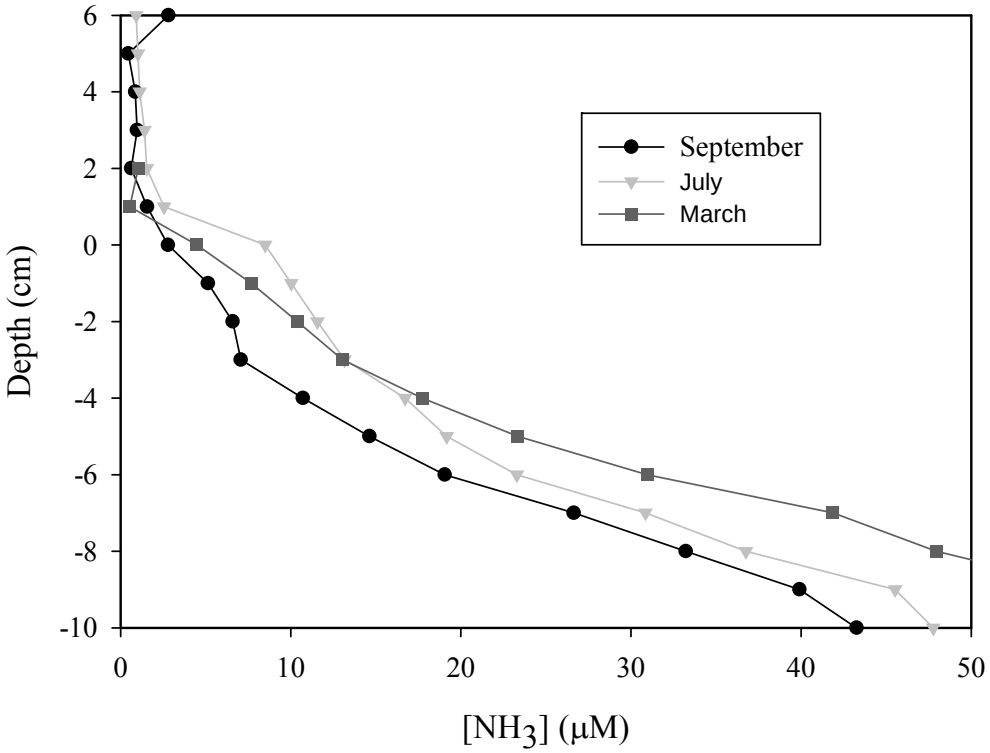

Fig. A1. Ammonia peeper profile at the Central Lake Outlet Site (CLO). Ammonia concentration profiles at the CLO site in March, June and September 2009. Negative depths refer to distance into the sediment. The profiles are truncated at 10-cm sediment depth for clarity of display. Error bars (not shown, for clarity) from multiple peeper results, expressed as percentage relative standard deviation, are typically 43% of each concentration datum.