

**Supplementary Table S1.**  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , NPDOC and  $\text{O}_2$  concentration (mM) and the isotopic data measured in systems. (BDL means below detection limit and NA means data is not available or measured).

Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
INF180306	Inflow	INF	-	2.59	0.01	2.11	NA	9.4	NA	NA
INF180307	Inflow	INF	15.40	2.27	0.01	NA	0.23	10.1	NA	NA
INF180323	Inflow	INF	-	3.96	0.01	NA	NA	NA	NA	NA
INF180325	Inflow	INF	12.00	0.93	0.06	NA	0.27	NA	NA	NA
INF180326	Inflow	INF	13.20	1.50	0.01	NA	0.28	NA	NA	NA
INF180327	Inflow	INF	13.40	2.06	BDL	NA	0.15	10.0	NA	NA
INF180328	Inflow	INF	15.1	2.46	BDL	NA	0.08	NA	NA	NA
INF180329	Inflow	INF	15.6	3.29	BDL	NA	0.06	NA	NA	NA
INF180330	Inflow	INF	15.6	3.51	BDL	NA	0.35	NA	NA	NA
INF180331	Inflow	INF	14.8	3.46	BDL	NA	0.35	NA	NA	NA
INF180401	Inflow	INF	15.1	2.46	0.01	NA	0.34	NA	NA	NA
INF180402	Inflow	INF	15.6	2.33	BDL	NA	0.49	NA	NA	NA
INF180403	Inflow	INF	17.9	2.57	BDL	NA	0.37	NA	NA	NA
INF180404	Inflow	INF	16.7	2.23	0.01	NA	0.33	NA	NA	NA
INF180405	Inflow	INF	16.8	2.19	BDL	NA	0.40	NA	NA	NA
INF180406	Inflow	INF	17.8	4.34	0.01	NA	0.40	NA	NA	NA
INF180407	Inflow	INF	18.8	4.24	0.01	NA	0.37	NA	NA	NA
INF180511	Inflow	INF	22.4	5.29	BDL	1.08	0.37	8.2	NA	NA
INF180523	Inflow	INF	22	3.07	BDL	1.14	0.05	8.8	NA	NA
INF180525	Inflow	INF	24.2	2.63	0.01	1.31	0.04	NA	NA	NA
INF180720	Inflow	INF	27.2	3.51	0.01	NA	0.08	NA	NA	NA
INF180724	Inflow	INF	27.4	4.57	BDL	NA	0.09	NA	NA	NA
INF180725	Inflow	INF		3.86	0.01	NA	NA	NA	NA	NA

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Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
INF180727	Inflow	INF	27.5	3.77	0.01	NA	0.09	NA	NA	NA
INF180730	Inflow	INF	27.3	3.67	0.01	1.10	0.06	10.1	NA	NA
INF180731	Inflow	INF	29.3	4.39	BDL	1.41	0.07	NA	NA	NA
INF 180829	Inflow	INF	26.8	NA	NA	NA	NA	10.4	NA	NA
INF180905	Inflow	INF	26.1	5.54	0.01	1.48	0.32	NA	NA	NA
INF181210	Inflow	INF	14.60	2.61	0.01	0.92	0.19	NA	NA	NA
INF181211	Inflow	INF	15.4	2.92	0.01	0.95	0.23	NA	NA	NA
T2O180327	Control	P-O	11	0.55	0.43	NA	0.03	NA	7.6	10.0
T2O180405	Control	P-O	16.1	NA	NA	NA	0.02	NA	NA	NA
T2O180511	Control	P-O	18.8	3.69	0.01	0.94	0.02	NA	15.5	16.7
T2O180525	Control	P-O	21	2.32	0.02	0.97	0.02	14.3	13.1	16.9
T2O180731	Control	P-O	27	4.10	0.02	1.15	0.03	12.1	23.8	35.8
T2O180905	Control	P-O	24.1	2.51	0.01	1.06	0.04	13.8	NA	NA
T2O181211	Control	P-O	13.40	2.11	0.09	0.70	0.06	NA	NA	NA
T2A1180327	Control	P-A1	11.9	NA	BDL	NA	0.01	NA	NA	NA
T2A1180511	Control	P-A1	17.8	1.68	0.18	0.70	0.03	NA	14.3	17.8
T2A1180731	Control	P-A1	27	1.37	0.92	1.08	0.07	16.8	22.3	28.3
T2A1181210	Control	P-A1	15.00	0.19	0.40	0.56	0.05	NA	NA	NA
T2A1180405	Control	P-A1		NA	NA	NA	0.01	NA	NA	NA
T2A2180511	Control	P-A2	18.4	3.00	0.01	0.87	0.03	NA	NA	NA
T2A3180327	Control	P-A3	10.6	NA	NA	NA	0.03	NA	NA	NA
T2A3180405	Control	P-A3		NA	NA	NA	0.03	NA	NA	NA
T2A3180511	Control	P-A3	18.2	3.00	0.05	0.79	0.04	NA	20.2	28.4

**Supplementary Table S1.**  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , NPDOC and  $\text{O}_2$  concentration (mM) and the isotopic data measured in systems. (BDL means below detection limit and NA means data is not available or measured).

Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
T2A3180731	Control	P-A3	26.5	2.72	0.01	1.13	0.06	8.4	11.4	11.8
T2A3181210	Control	P-A3	13.40	1.02	0.21	0.64	0.14	NA	NA	NA
T2B1180327	Control	P-B1	12.5	NA	NA	NA	0.01	NA	NA	NA
T2B1180516	Control	P-B1	16.6	0.69	0.04	NA	0.03	NA	NA	NA
T2B1180525	Control	P-B1	17.1	0.58	0.00	0.58	0.03	NA	NA	NA
T2B1 180523	Control	P-B1	26.8	NA	NA	NA	NA	24.9	NA	NA
T2B2180516	Control	P-B2	16.6	1.60	0.04	NA	0.03	NA	NA	NA
T2B2 180523	Control	P-B2		NA	NA	NA	NA	17.3	NA	NA
T2B2180525	Control	P-B2	17.8	1.15	0.01	0.73	0.03	NA	NA	NA
T2B3180327	Control	P-B3		NA	NA	NA	0.03	NA	NA	NA
T2B3180516	Control	P-B3	16	1.81	0.01	NA	0.05	NA	NA	NA
T2B3 180523	Control	P-B3		NA	NA	NA	NA	17.0	NA	NA
T2B3180525	Control	P-B3	19.4	1.21	0.01	0.66	0.04	NA	NA	NA
T2C1180307	Control	P-C1	11.50	1.14	1.70	0.76	0.02	NA	4.6	9.2
T2C1180327	Control	P-C1		NA	NA	NA	0.01	NA	NA	NA
T2C1180523	Control	P-C1	16.7	1.03	0.02	0.66	0.02	18.4	NA	NA
T2C1180731	Control	P-C1	23.4	1.36	0.31	0.79	0.05	18.1	24.1	35.6
T2C1181210	Control	P-C1	15.00	0.25	1.03	0.43	0.06	NA	NA	NA
T2C2180523	Control	P-C2	17.4	1.32	0.04	0.69	0.03	16.4	8.1	10.5
T2C3180306	Control	P-C3	10.40	0.20	0.10	0.73	0.02	NA	27.0	41.9
T2C3180327	Control	P-C3		NA	NA	NA	0.07	NA	NA	NA
T2C3180523	Control	P-C3	18.9	0.03	0.01	0.79	0.08	NA	NA	NA
T2C3180731	Control	P-C3	24.3	0.01	NA	0.87	0.10	NA	NA	NA

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Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
T2C3181210	Control	P-C3	12.50	0.01	0.52	0.55	0.36	NA	NA	NA
T2Ex180307	Control	Outlet	11.70	1.63	1.24	NA	0.07	NA	10.6	15.7
T2Ex180326	Control	Outlet	12.20	1.18	0.87	NA	0.16	NA	NA	NA
T2Ex180327	Control	Outlet	12.70	1.28	0.79	NA	NA	NA	11.0	14.8
T2Ex180328	Control	Outlet	12.5	1.32	0.88	NA	0.17	NA	NA	NA
T2Ex180329	Control	Outlet	13.5	1.14	1.02	NA	0.14	NA	NA	NA
T2Ex180330	Control	Outlet	13.3	1.14	1.08	NA	0.17	NA	NA	NA
T2Ex180331	Control	Outlet	12.9	1.23	1.17	NA	0.17	NA	NA	NA
T2Ex180401	Control	Outlet	12.7	0.92	1.17	NA	0.19	NA	NA	NA
T2Ex180402	Control	Outlet	13.2	0.87	1.09	NA	0.16	NA	NA	NA
T2Ex180403	Control	Outlet	15.1	0.86	0.90	NA	0.14	NA	NA	NA
T2Ex180404	Control	Outlet	14.2	0.79	0.85	NA	0.16	NA	NA	NA
T2Ex180405	Control	Outlet	14.5	0.74	0.83	NA	0.16	NA	NA	NA
T2Ex180406	Control	Outlet	15.9	1.26	0.90	NA	0.14	NA	NA	NA
T2Ex180407	Control	Outlet	14.9	1.10	0.73	NA	0.13	NA	NA	NA
T2Ex180523	Control	Outlet	22	0.89	0.03	0.73	0.14	17.1	NA	NA
T2Ex180622	Control	Outlet	20.3	1.82	NA	NA	0.07	NA	NA	NA
T2Ex180731	Control	Outlet	24.7	0.55	0.59	0.72	0.17	18.7	14.4	27.3
T2Ex180916	Control	Outlet	24.4	1.60	0.01	0.89	0.18	15.5	NA	NA
T2Ex181211	Control	Outlet	13.70	0.11	0.80	0.53	0.20	NA	NA	NA
T4O180327	MAR-PRB	P-O	11.3	0.93	0.79	NA	0.03	NA	8.5	11.5
T4O180511	MAR-PRB	P-O	18.72	3.41	0.06	1.98	0.04	NA	NA	NA
T4O180525	MAR-PRB	P-O	20.4	1.29	0.19	2.15	0.02	15.4	12.1	20.3

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Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
T4O180731	MAR-PRB	P-O	27.2	2.11	0.39	2.29	0.04	16.8	9.9	20.2
T4O180905	MAR-PRB	P-O	24.1	2.68	0.00	1.64	0.03	9.6	NA	NA
T4O180405	MAR-PRB	P-O	15.7	NA	NA	NA	0.01	NA	NA	NA
T4O181211	MAR-PRB	P-O	13.70	1.39	0.56	0.86	0.05	NA	NA	NA
T4A1180327	MAR-PRB	P-A1	11.4	NA	NA	NA	0.01	NA	NA	NA
T4A1180405	MAR-PRB	P-A1	14.2	NA	NA	NA	0.00	NA	NA	NA
T4A1180511	MAR-PRB	P-A1	17.5	2.31	0.24	1.17	0.02	NA	16.6	21.3
T4A1180731	MAR-PRB	P-A1	26.3	0.49	0.52	1.41	0.19	19.6	15.9	25.3
T4A1181210	MAR-PRB	P-A1	15.20	0.38	0.74	0.71	0.05	NA	NA	NA
T4A2180511	MAR-PRB	P-A2	18.42	1.74	0.01	3.51	0.03	NA	NA	NA
T4A3180327	MAR-PRB	P-A3		NA	NA	NA	0.04	NA	NA	NA
T4A3180405	MAR-PRB	P-A3	13.2	NA	NA	NA	0.03	NA	NA	NA
T4A3180511	MAR-PRB	P-A3	18.1	2.69	0.01	1.86	0.16	NA	15.5	17.7
T4A3180731	MAR-PRB	P-A3	26.2	2.50	0.15	1.81	0.07	15.7	17.3	38.2
T4A3181210	MAR-PRB	P-A3	13.30	1.09	0.14	0.75	0.12	NA	NA	NA
T4B1180327	MAR-PRB	P-B1	12	NA	NA	NA	0.01	NA	NA	NA
T4B1180516	MAR-PRB	P-B1	16.6	1.19	0.10	NA	0.03	19.6	22.9	36.5
T4B1180525	MAR-PRB	P-B1	17.1	0.96	0.06	0.94	0.03	19.2	NA	NA
T4B2180516	MAR-PRB	P-B2	16.6	1.18	0.06	NA	0.04	21.8	7.7	10.5
T4B2180525	MAR-PRB	P-B2	17.9	1.19	0.00	1.95	0.04	19.2	NA	NA
T4B3180327	MAR-PRB	P-B3		NA	NA	NA	0.04	NA	NA	NA
T4B3180516	MAR-PRB	P-B3	17.1	0.60	0.00	NA	0.06	NA	NA	NA
T4B3180525	MAR-PRB	P-B3		0.72	0.01	1.23	0.04	19.1	NA	NA

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Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
T4C1180307	MAR-PRB	P-C1	11.70	0.91	1.92	2.16	0.02	NA	16.1	21.4
T4C1180327	MAR-PRB	P-C1		NA	NA	NA	0.01	NA	NA	NA
T4C1180523	MAR-PRB	P-C1	17.1	0.80	0.03	1.24	0.04	18.5	13.7	17.6
T4C1180731	MAR-PRB	P-C1	23	1.43	1.42	1.18	0.04	19.7	8.9	17.8
T4C1181210	MAR-PRB	P-C1	15.20	1.24	1.29	0.79	0.06	NA	NA	NA
T4C2180523	MAR-PRB	P-C2	17.8	0.73	0.23	2.04	0.06	18.6	10.9	16.4
T4C3180306	MAR-PRB	P-C3	10.40	0.06	NA	0.72	0.09	NA	15.1	22.3
T4C3180327	MAR-PRB	P-C3		NA	NA	NA	0.05	NA	NA	NA
T4C3180523	MAR-PRB	P-C3	19.9	0.08	0.01	1.16	0.08	34.7	NA	NA
T4C3180731	MAR-PRB	P-C3	23.9	0.01	1.80	1.03	0.15	NA	17.6	28.1
T4C3181210	MAR-PRB	P-C3	12.60	0.05	0.02	0.71	0.30	NA	NA	NA
T4Ex180307	MAR-PRB	Outlet	12.50	1.53	1.72	NA	0.22	NA	5.6	10.8
T4Ex180326	MAR-PRB	Outlet	11.9	1.35	0.55	NA	0.19	NA	NA	NA
T4Ex180327	MAR-PRB	Outlet	11.90	1.45	0.54	NA	0.21	NA	NA	NA
T4Ex180328	MAR-PRB	Outlet	12.30	1.38	0.57	NA	0.17	NA	NA	NA
T4Ex180329	MAR-PRB	Outlet	13.4	1.49	0.55	NA	0.16	NA	NA	NA
T4Ex180330	MAR-PRB	Outlet	13.2	1.46	0.58	NA	0.14	NA	NA	NA
T4Ex180331	MAR-PRB	Outlet	12.8	1.56	0.64	NA	0.19	NA	NA	NA
T4Ex180401	MAR-PRB	Outlet	12.6	1.11	0.63	NA	0.17	NA	NA	NA
T4Ex180402	MAR-PRB	Outlet	13.3	1.10	0.51	NA	0.15	NA	NA	NA
T4Ex180403	MAR-PRB	Outlet	14.3	1.05	0.44	NA	0.15	NA	NA	NA
T4Ex180404	MAR-PRB	Outlet	14	1.02	0.39	NA	0.14	NA	NA	NA
T4Ex180405	MAR-PRB	Outlet	14.3	0.90	0.39	NA	0.13	NA	NA	NA

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Reference	System	Section	Temp (°C)	$\text{NH}_4^+$ (mM)	$\text{NO}_3^-$ (mM)	NPDOC (mM)	$\text{O}_2$ (mM)	$\delta^{15}\text{N-NH}_4^+$	$\delta^{18}\text{O-NO}_3^-$	$\delta^{15}\text{N-NO}_3^-$
T4Ex180406	MAR-PRB	Outlet	15	1.54	0.43	NA	0.15	NA	NA	NA
T4Ex180407	MAR-PRB	Outlet	15	1.54	0.45	NA	0.15	NA	NA	NA
T4Ex180523	MAR-PRB	Outlet	20	0.99	0.05	1.33	0.09	NA	11.1	16.5
T4Ex180622	MAR-PRB	Outlet	19.9	1.92	0.13	NA	0.09	NA	NA	NA
T4Ex180731	MAR-PRB	Outlet	24.4	0.58	0.69	1.28	0.17	22.6	13.5	25.3
T4Ex180916	MAR-PRB	Outlet	24	2.28	0.02	1.22	0.20	NA	NA	NA
T4Ex181211	MAR-PRB	Outlet	13.60	0.48	0.52	0.70	0.30	NA	NA	NA

**Supplementary Table S2.**  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , NPDOC and  $\text{O}_2$  aqueous concentration (mM) measured at the 3 sampling piezometer depths (NA means data is not available or measured).

Reference	Treatment	Sampling point	Depth	$\text{NH}_4^+$	$\text{NO}_3^-$ (mM)	DOC (mM)	$\text{O}_2$ (mM)
T2A3180327	Control	P-A3	0.3-0.4 m	NA	NA	NA	0.03
T2A3180405	Control	P-A3	0.3-0.4 m	NA	NA	NA	0.03
T2A3180511	Control	P-A3	0.3-0.4 m	3.00	0.05	0.79	0.04
T2A3180731	Control	P-A3	0.3-0.4 m	2.72	0.01	1.13	0.06
T2A3181210	Control	P-A3	0.3-0.4 m	1.02	0.21	0.64	0.14
T2B3180327	Control	P-B3	0.3-0.4 m	NA	NA	NA	0.03
T2B3180516	Control	P-B3	0.3-0.4 m	1.81	0.01	NA	0.05
T2B3180525	Control	P-B3	0.3-0.4 m	1.21	0.01	0.66	0.04
T2C3180306	Control	P-C3	0.3-0.4 m	0.20	0.10	0.73	0.02
T2C3180327	Control	P-C3	0.3-0.4 m	NA	NA	NA	0.07
T2C3180523	Control	P-C3	0.3-0.4 m	0.03	0.01	0.79	0.08
T2C3180731	Control	P-C3	0.3-0.4 m	0.01	NA	0.87	0.10
T2C3181210	Control	P-C3	0.3-0.4 m	0.01	0.52	0.55	0.36
T2A2180511	Control	P-A2	0.8-0.9 m	3.00	0.01	0.87	0.03
T2B2180516	Control	P-B2	0.8-0.9 m	1.60	0.04	NA	0.03
T2B2180525	Control	P-B2	0.8-0.9 m	1.15	0.01	0.73	0.03
T2C2180523	Control	P-C2	0.8-0.9 m	1.32	0.04	0.69	0.03
T2A1180511	Control	P-A1	1.3-1.4 m	1.68	0.18	0.70	0.03
T2A1180731	Control	P-A1	1.3-1.4 m	1.37	0.92	1.08	0.07
T2A1181210	Control	P-A1	1.3-1.4 m	0.19	0.40	0.56	0.05
T2A1180405	Control	P-A1	1.3-1.4 m	NA	NA	NA	0.01
T2B1180327	Control	P-B1	1.3-1.4 m	NA	NA	NA	0.01
T2B1180516	Control	P-B1	1.3-1.4 m	0.69	0.04	NA	0.03
T2B1180525	Control	P-B1	1.3-1.4 m	0.58	0.00	0.58	0.03
T2C1180307	Control	P-C1	1.3-1.4 m	1.14	1.70	0.76	0.02
T2C1180327	Control	P-C1	1.3-1.4 m	NA	NA	NA	0.01
T2C1180523	Control	P-C1	1.3-1.4 m	1.03	0.02	0.66	0.02
T2C1180731	Control	P-C1	1.3-1.4 m	1.36	0.31	0.79	0.05
T2C1181210	Control	P-C1	1.3-1.4 m	0.25	1.03	0.43	0.06
T4A3180327	MAR-PRB	P-A3	0.3-0.4 m	NA	NA	NA	0.04
T4A3180405	MAR-PRB	P-A3	0.3-0.4 m	NA	NA	NA	0.03
T4A3180511	MAR-PRB	P-A3	0.3-0.4 m	2.69	0.01	1.86	0.16
T4B3180327	MAR-PRB	P-B3	0.3-0.4 m	NA	NA	NA	0.04
T4B3180516	MAR-PRB	P-B3	0.3-0.4 m	0.60	0.00	NA	0.06
T4B3180525	MAR-PRB	P-B3	0.3-0.4 m	0.72	0.01	1.23	0.04
T4C3180306	MAR-PRB	P-C3	0.3-0.4 m	0.06	NA	0.72	0.09
T4C3180327	MAR-PRB	P-C3	0.3-0.4 m	NA	NA	NA	0.05
T4C3180523	MAR-PRB	P-C3	0.3-0.4 m	0.08	0.01	1.16	0.08
T4C3180731	MAR-PRB	P-C3	0.3-0.4 m	0.01	1.80	1.03	0.15
T4C3181210	MAR-PRB	P-C3	0.3-0.4 m	0.05	0.02	0.71	0.30
T4A3180731	MAR-PRB	P-A3	0.3-0.4 m	2.50	0.15	1.81	0.07

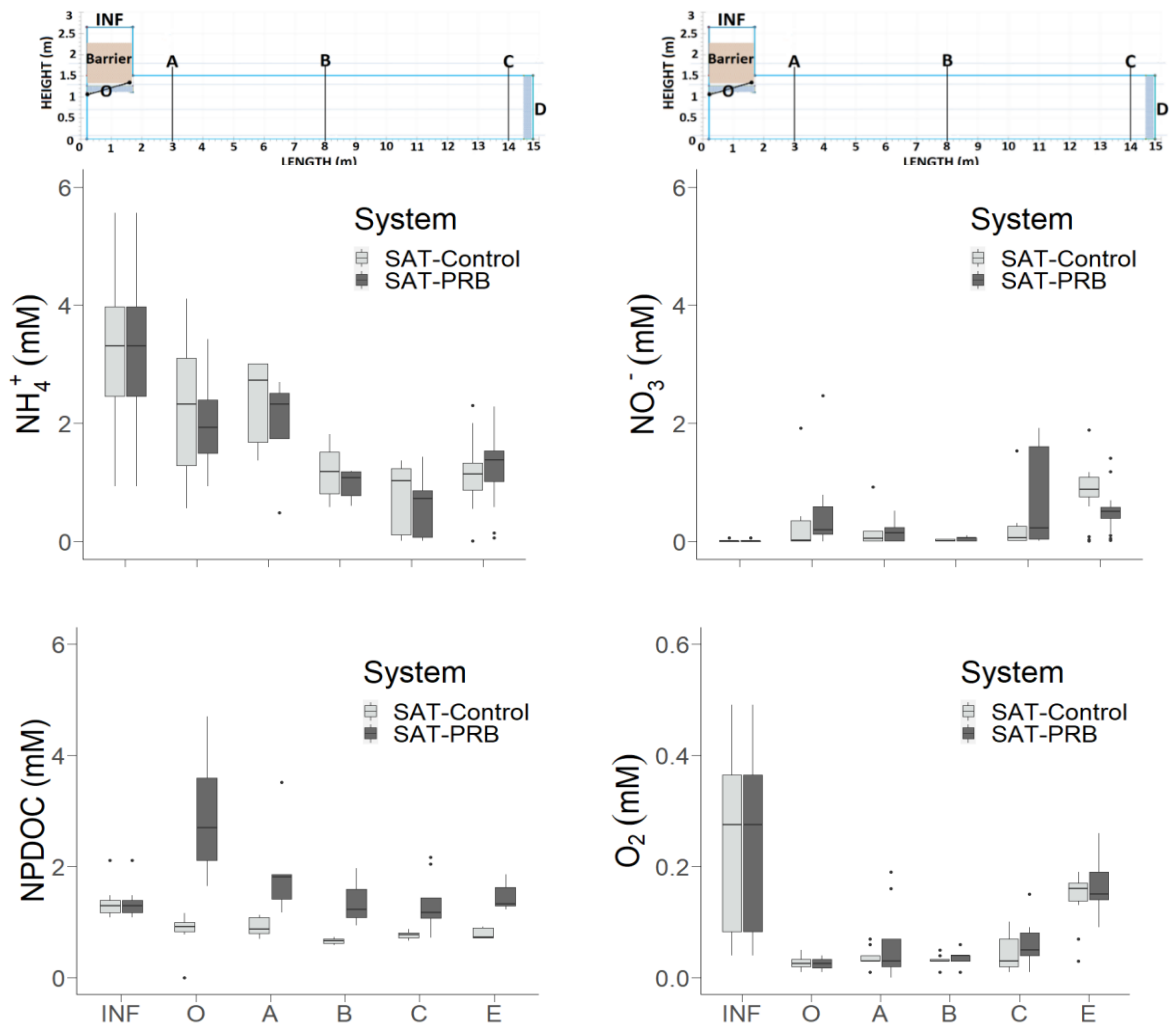


**Supplementary Table S2.**  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , NPDOC and  $\text{O}_2$  aqueous concentration (mM) measured at the 3 sampling piezometer depths (NA means data is not available or measured).

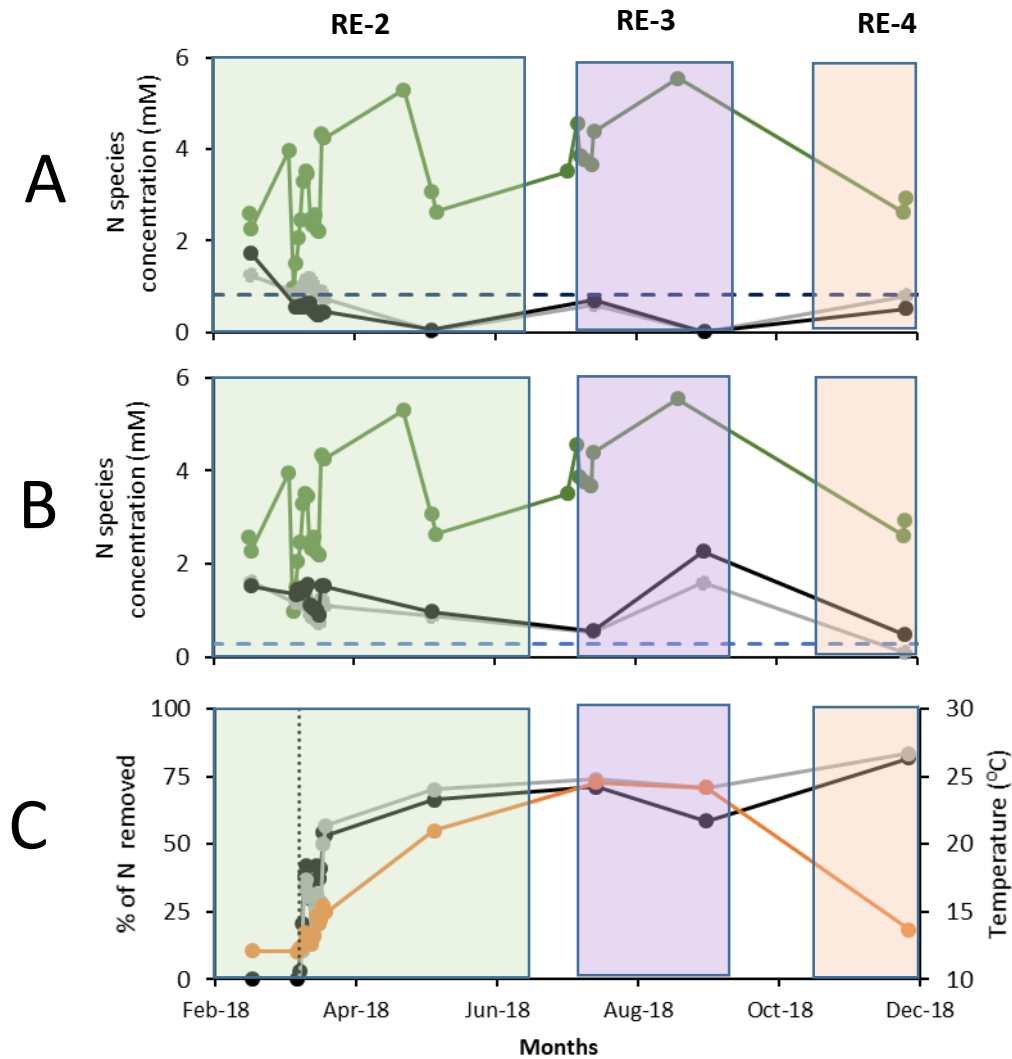
Reference	Treatment	Sampling point	Depth	$\text{NH}_4^+$	$\text{NO}_3^-$ (mM)	DOC (mM)	$\text{O}_2$ (mM)
T4A3181210	MAR-PRB	P-A3	0.3-0.4 m	1.09	0.14	0.75	0.12
T4A2180511	MAR-PRB	P-A2	0.8-0.9 m	1.74	0.01	3.51	0.03
T4B2180516	MAR-PRB	P-B2	0.8-0.9 m	1.18	0.06	NA	0.04
T4B2180525	MAR-PRB	P-B2	0.8-0.9 m	1.19	0.00	1.95	0.04
T4C2180523	MAR-PRB	P-C2	0.8-0.9 m	0.73	0.23	2.04	0.06
T4B1180327	MAR-PRB	P-B1	1.3-1.4 m	NA	NA	NA	0.01
T4B1180516	MAR-PRB	P-B1	1.3-1.4 m	1.19	0.10	NA	0.03
T4B1180525	MAR-PRB	P-B1	1.3-1.4 m	0.96	0.06	0.94	0.03
T4C1180307	MAR-PRB	P-C1	1.3-1.4 m	0.91	1.92	2.16	0.02
T4C1180327	MAR-PRB	P-C1	1.3-1.4 m	NA	NA	NA	0.01
T4C1180523	MAR-PRB	P-C1	1.3-1.4 m	0.80	0.03	1.24	0.04
T4C1180731	MAR-PRB	P-C1	1.3-1.4 m	1.43	1.42	1.18	0.04
T4C1181210	MAR-PRB	P-C1	1.3-1.4 m	1.24	1.29	0.79	0.06

**Supplementary Table S3.** Isotopic fractionation of ammonium ( $\epsilon^{15}\text{N-NH}_4^+$ ) during recharge episode.

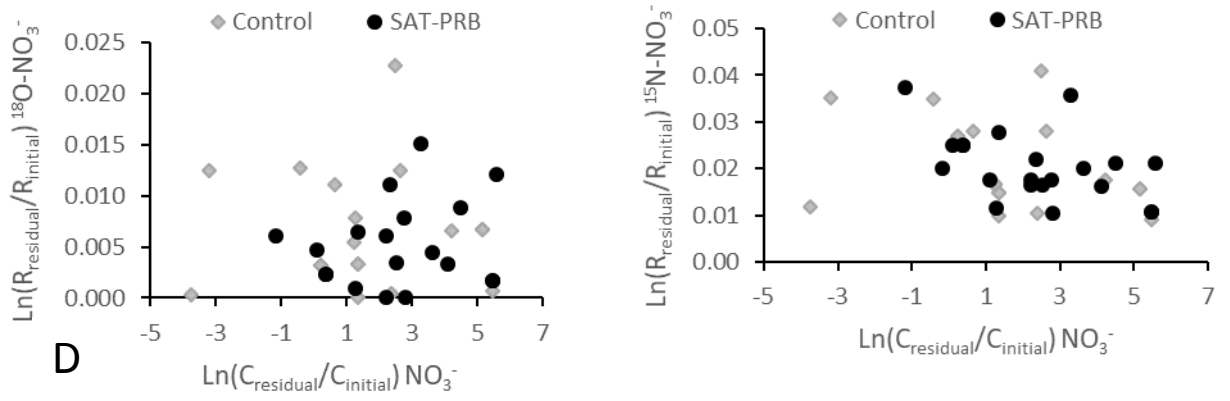
Recharge episode	$\epsilon^{15}\text{N-NH}_4^+$ [‰] ( $R^2$ )	
	SAT-PRB	Control
RE-2	-5 ‰ ( <b>0.9</b> )	-7 ‰ ( <b>0.8</b> )
RE-3	-5 ‰ ( <b>0.5</b> )	-5 ‰ ( <b>0.5</b> )
RE-4	-5 ‰ ( <b>0.7</b> )	-5 ‰ ( <b>1.0</b> )



**Fig. S1.**  $\text{NH}_4^+$ , NPDOC,  $\text{O}_2$  and  $\text{NO}_3^-$  aqueous concentration along the flow path in systems (all recharge episodes) and a scheme showing sections along the systems (Concentrations are indicated by the box plots and the outliers represented by the dots, values in A, B, and C, have been calculated using the samples belonging to all the different depths at each section. INF = inflow concentration and D is the outflow concentration).



**Fig. S2** (A) Distribution of INF  $\text{NH}_4^+$  (total N) and residual  $\text{NO}_3^-$  concentration at E; (B) distribution of INF  $\text{NH}_4^+$  and residual  $\text{NH}_4^+$  concentration at E; (C) the % of N ( $\text{NH}_4^+ + \text{NO}_3^-$ ) removed from solution and the average temperature in both systems. Grey circles represent the Control system, black circles represent SAT-PRB system, green circles represent INF  $\text{NH}_4^+$  and orange circles represent the average temperature in both systems. The dashed lines represent  $\text{NO}_3^-$  threshold value (figure A) and  $\text{NH}_4^+$  threshold value (figure B) and the dotted line represents the point below which we have zero N removal from the systems (figure C).



**Fig. S3.** Evolution  $\delta^{15}\text{N-NO}_3^-$  and  $\delta^{18}\text{O-NO}_3^-$  versus  $[\text{NO}_3^-]$  in control and SAT-PRB systems (D and E). INF refers to inflow water.