

Calculation of hypolimnic denitrification in a dimictic freshwater lake during summer stratification

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Table S1

q PCR Data for 16 S rDNA and nirS cell counts

Date	11.05.2015		27.05.2015		19.06.2015		24.06.2015	
	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹
depth [m]								
0	5,16E+08	4,14E+03	2,27E+08	1,05E+03	3,15E+08	3,72E+02	4,27E+08	4,41E+02
4								
5							4,27E+08	4,41E+02
6		4,14E+03	2,27E+08	1,05E+03	3,15E+08	3,72E+02		
7	4,40E+08	1,21E+04						
8			3,92E+08	4,86E+03	5,06E+07	8,29E+02	1,45E+08	6,60E+02
9								
14								
15	3,67E+08	3,48E+03	3,01E+08	7,27E+03	2,33E+08	6,19E+03	6,51E+08	7,25E+04
20	2,93E+08	4,32E+03	5,19E+08	1,85E+04	8,09E+08	1,20E+05	1,33E+09	3,42E+05
25	2,22E+08	5,00E+03	4,67E+08	2,28E+04	1,08E+09	2,29E+05	3,38E+09	1,41E+06
30	2,70E+08	1,64E+04	7,35E+08	5,33E+04	1,82E+09	5,09E+05	4,58E+09	2,06E+06

Date	07.07.2015		22.07.2015		03.08.2015		18.08.2015	
	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹
depth [m]								
0	2,95E+06	2,34E+03	4,99E+05	1,01E+02	1,01E+06	1,08E+03	9,16E+05	8,32E+02
4							9,16E+05	8,32E+02
5	2,95E+06	2,34E+03						
7								
8	3,00E+06	4,52E+05			1,01E+06	1,08E+03	7,12E+05	6,93E+04
9					3,54E+06	1,31E+06		
10			4,99E+05	1,01E+02				
11			2,94E+06	1,39E+06				
14								
15	3,61E+06	5,31E+05	2,22E+06	4,72E+05	5,22E+06	1,73E+06	1,63E+06	5,40E+05
20	7,54E+06	1,84E+06	4,63E+06	1,08E+06	8,40E+06	2,55E+06	2,44E+06	7,23E+05
25	1,64E+07	3,30E+06	5,28E+06	1,06E+06	7,46E+06	2,23E+06	1,28E+07	3,85E+05
30	1,33E+07	3,20E+06	3,59E+06	7,82E+05	8,40E+06	1,71E+06	1,72E+06	4,35E+05

Date	02.09.2015		15.09.2015		01.10.2015		15.10.2015	
	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹
depth [m]								
0	2,59E+06	3,65E+03	1,61E+06	1,51E+04	3,22E+07	5,80E+04	1,35E+07	1,05E+06
4								
5								
6	2,59E+06	3,65E+03						
7								
8								
9			1,61E+06	1,51E+04				
10								
11	2,31E+07	1,48E+07	9,93E+06	6,08E+06				
12					3,22E+07	5,80E+04	1,35E+07	1,05E+06
13								
14					1,97E+08	5,87E+06		
15	2,74E+08	2,00E+07	2,96E+06	2,61E+06	1,95E+08	1,42E+07	1,58E+07	4,61E+04
20	1,96E+07	1,99E+07	2,97E+06	2,68E+06	2,12E+08	7,06E+06	5,38E+06	1,09E+06
25	3,65E+07	1,98E+07	4,95E+06	2,82E+06	3,98E+08	6,60E+06	1,80E+07	1,20E+06
30	1,54E+07	1,12E+07	4,73E+06	2,13E+06	5,42E+08	6,18E+06	2,30E+07	5,46E+05

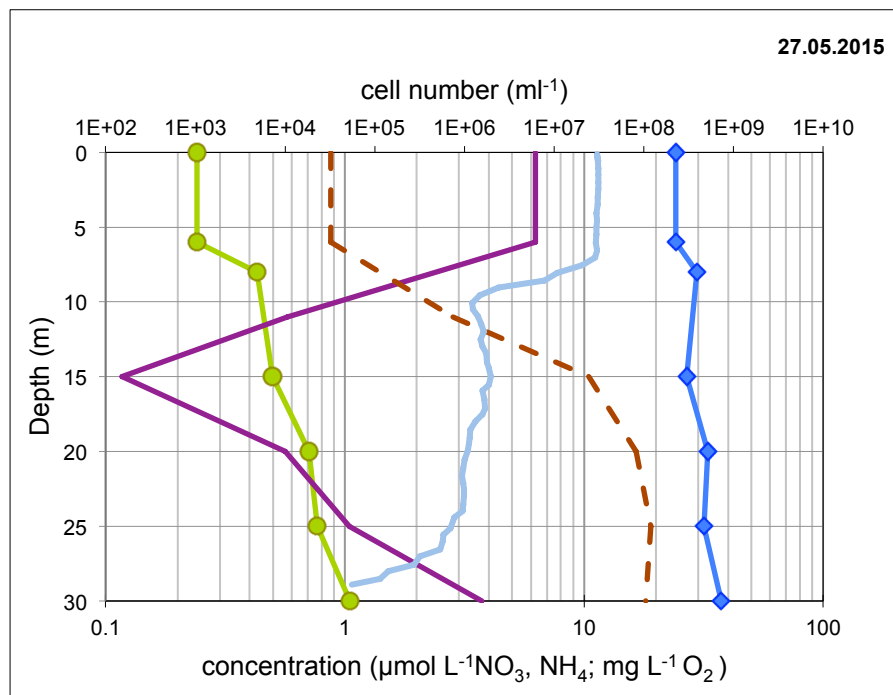
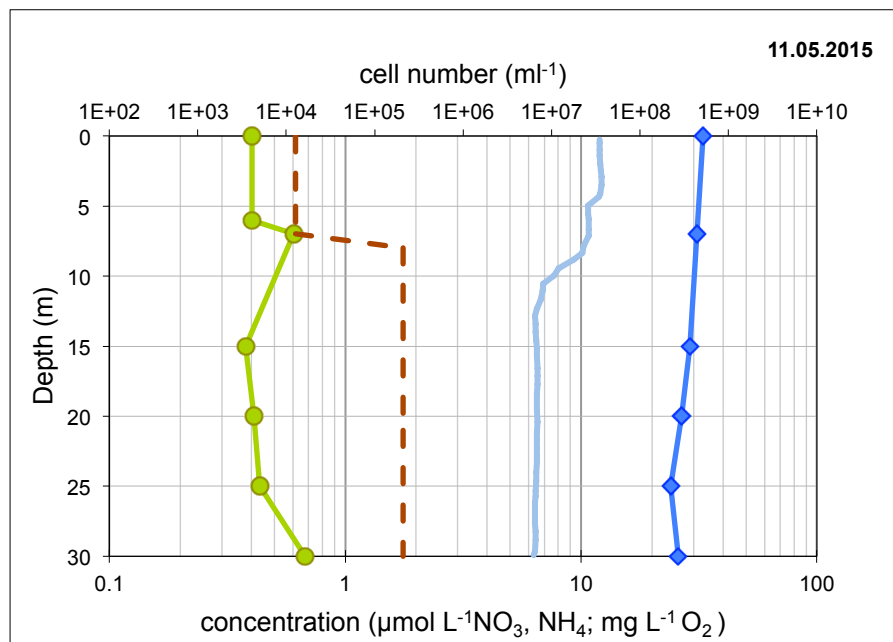
Date	26.10.2015		09.11.2015		24.11.2015	
	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹	16S n mL ⁻¹	nirS n mL ⁻¹
depth [m]						
0	3,51E+07	2,37E+05	4,39E+07	2,53E+05	2,65E+07	1,35E+04
4						
12						
13	3,51E+07	2,37E+05	4,39E+07	2,53E+05		
14						
15	9,82E+07	3,45E+06	1,98E+08	1,95E+06		
20	4,80E+07	7,18E+05			2,65E+07	1,35E+04
25			9,01E+07	1,26E+06	3,82E+07	2,23E+05
30	6,67E+07	7,61E+05	2,05E+08	1,05E+06	3,82E+07	2,23E+05

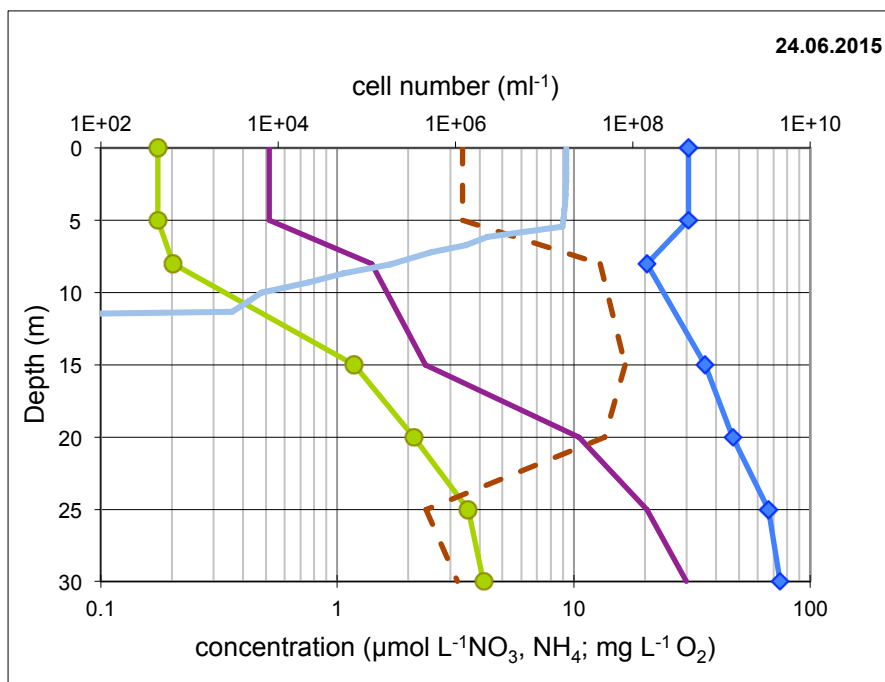
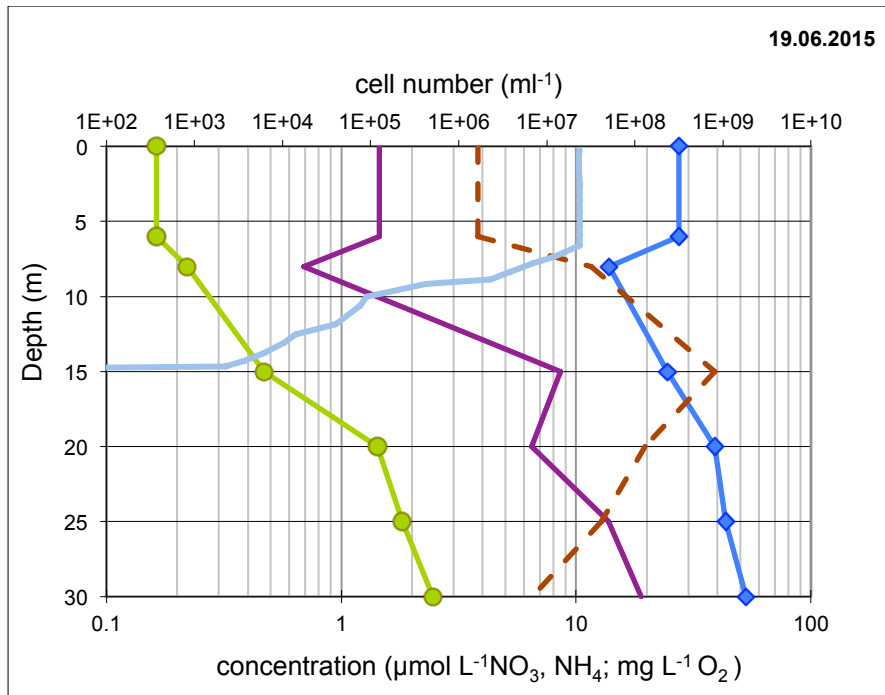
Table S2. Numbers of actively growing and nirS gene copy numbers in the lab experiment with *P. aeruginosa* at different times after nitrate depletion

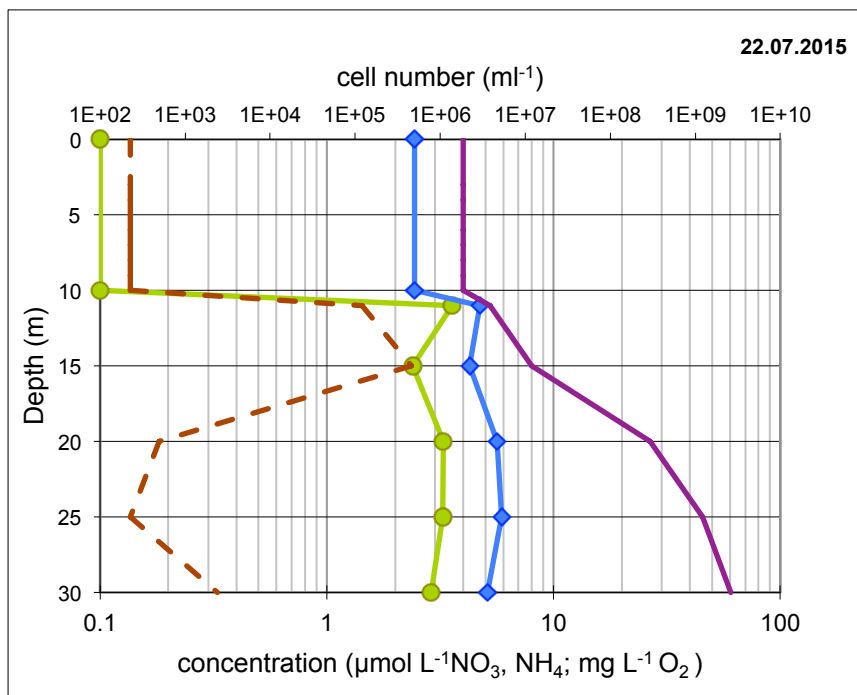
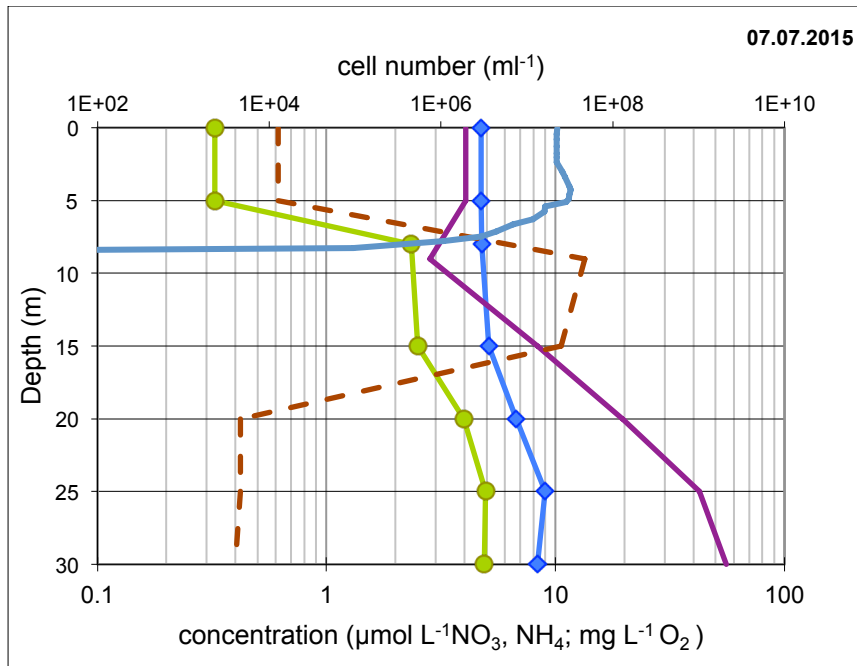
Sampling [d]	Nitrate concentration [mmol l ⁻¹]	cell count MPN [ml ⁻¹]	cell count functional gene <i>nirS</i> [ml ⁻¹]	ratio <i>nirS</i> / MPN
0.10	149	6.80 10 ⁷	1.36 10 ⁹	20.0
0.29	5	3.30 10 ⁸	3.01 10 ⁹	9.13
1.29	0	4.30 10 ⁸	4.50 10 ⁹	10.48
5.08	0	9.30 10 ⁶	2.12 10 ⁹	1074
12.04	0	1.90 10 ⁶	9.99 10 ⁹	1465
35.06	0	8.65 10 ⁵	2.78 10 ⁹	768

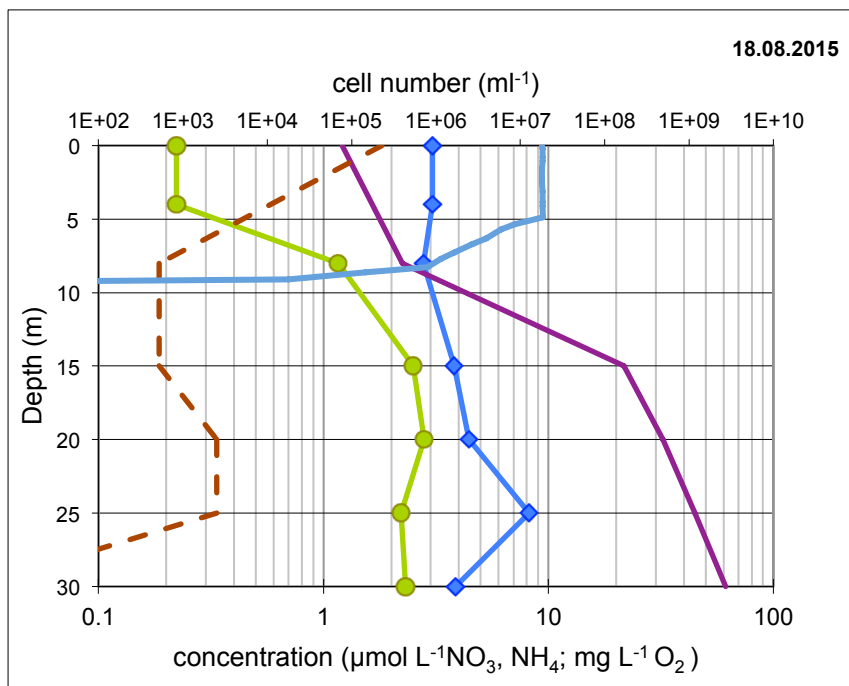
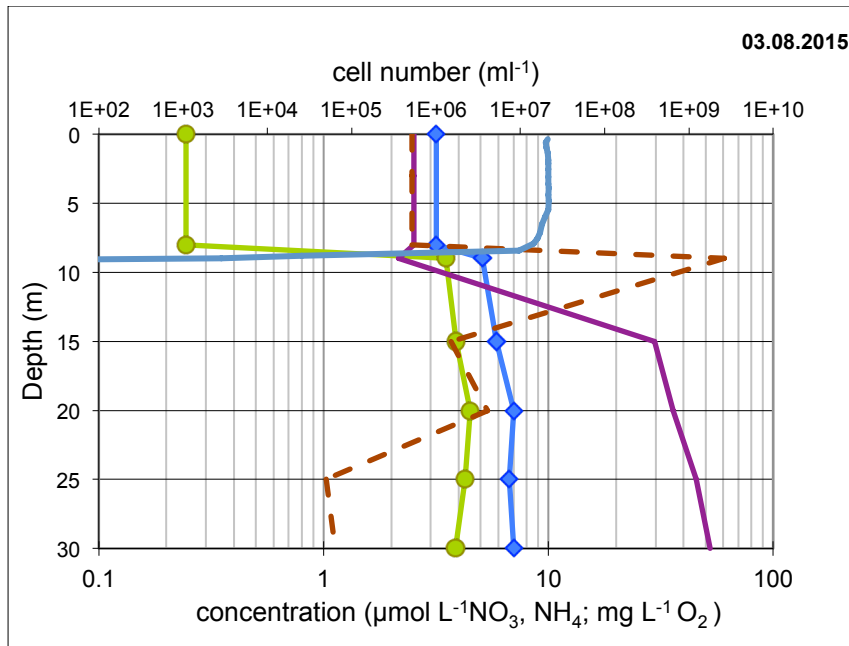
Fig. S1

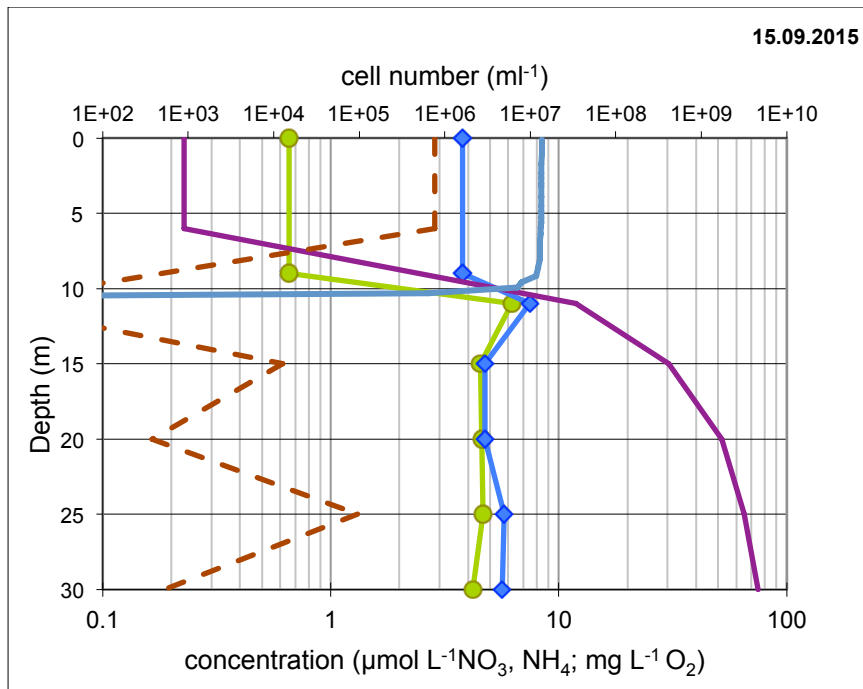
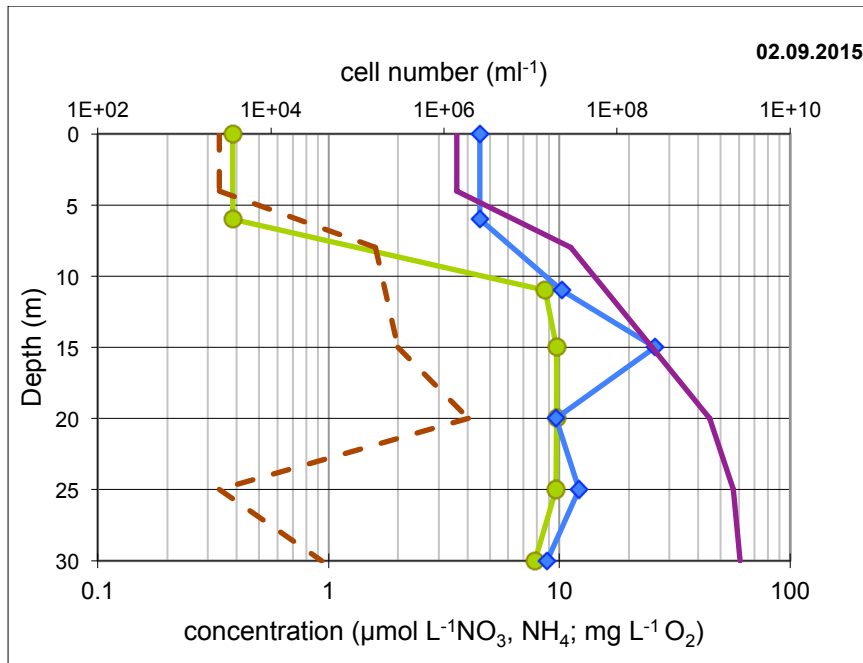
Vertical profiles of dissolved oxygen (O_2), nitrate (NO_3), ammonia, denitrifying bacteria (from *nirS* gene copy numbers), total cell numbers (from 16S rRNA) (A) before establishing stratification layers and at different times during stratification in the Scharmützelsee.

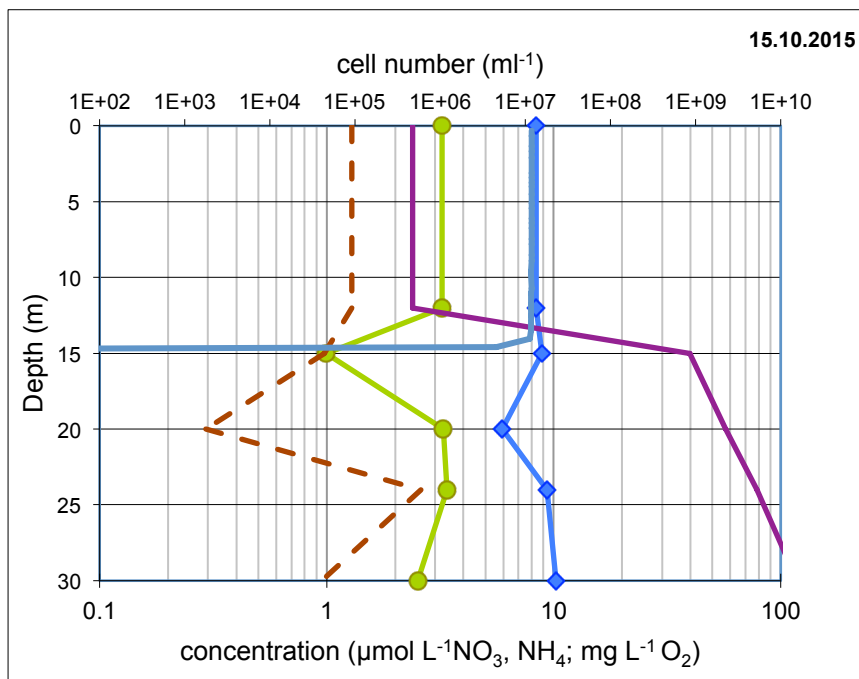
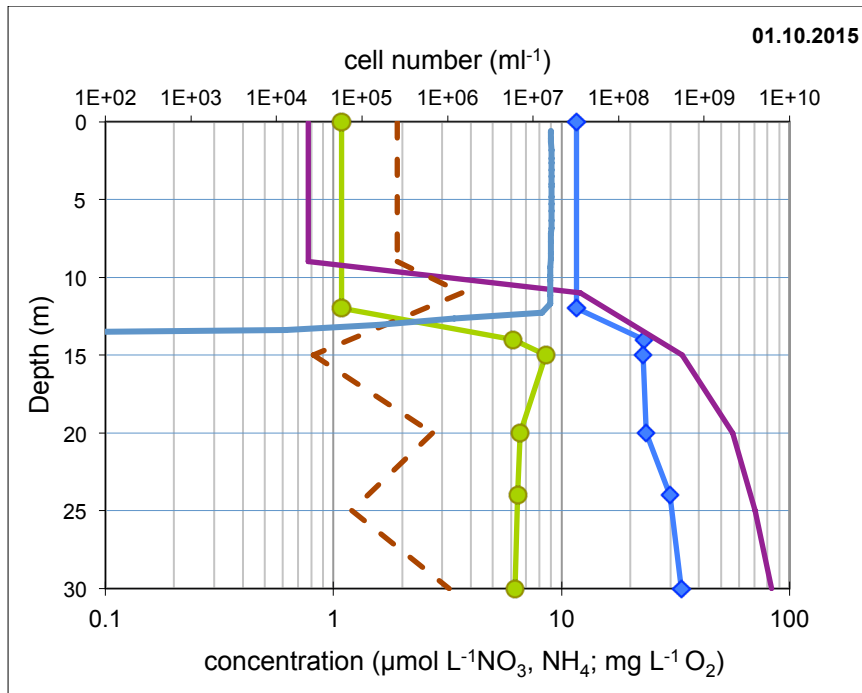


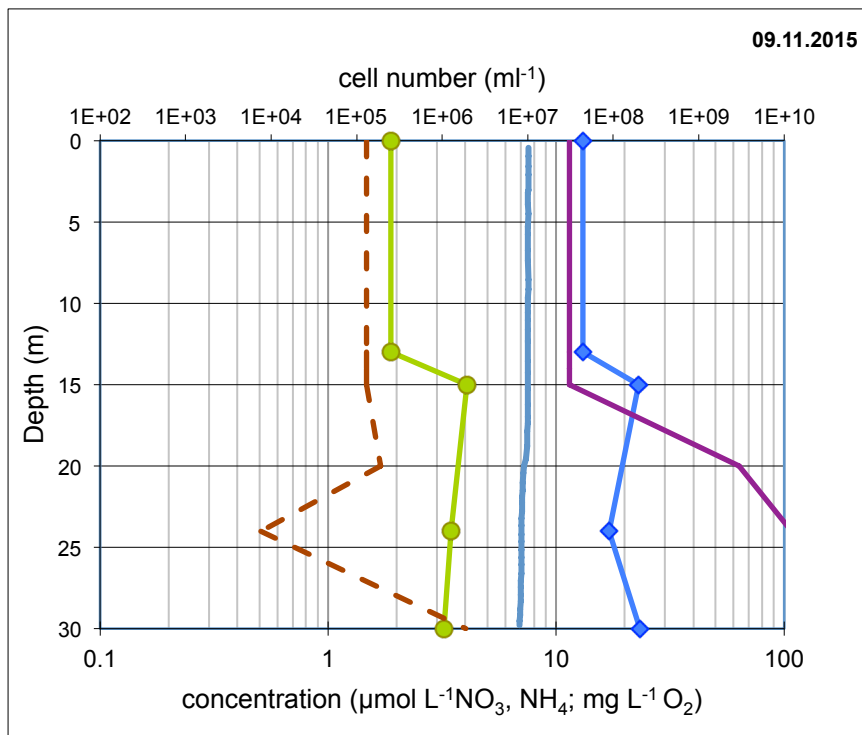
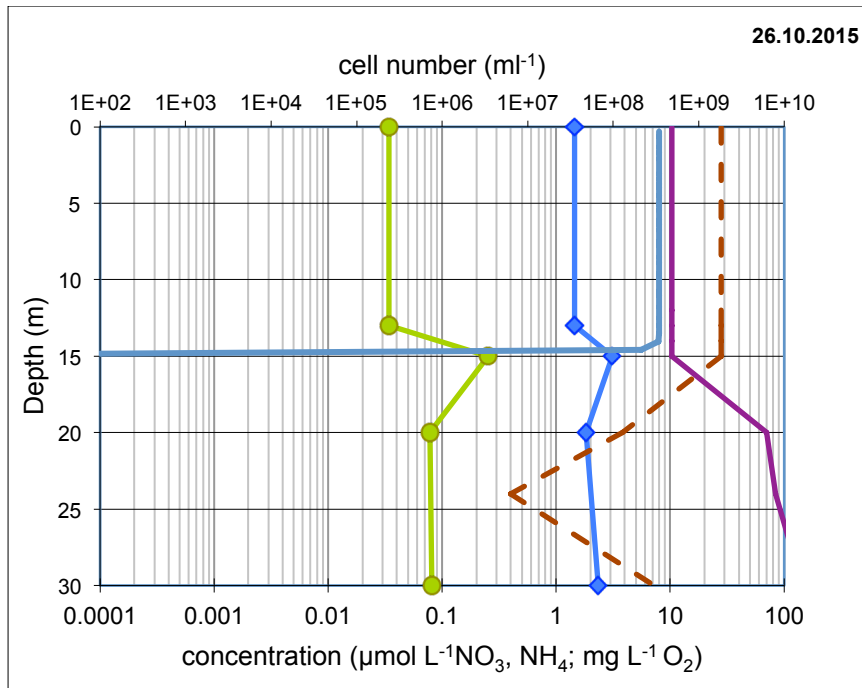


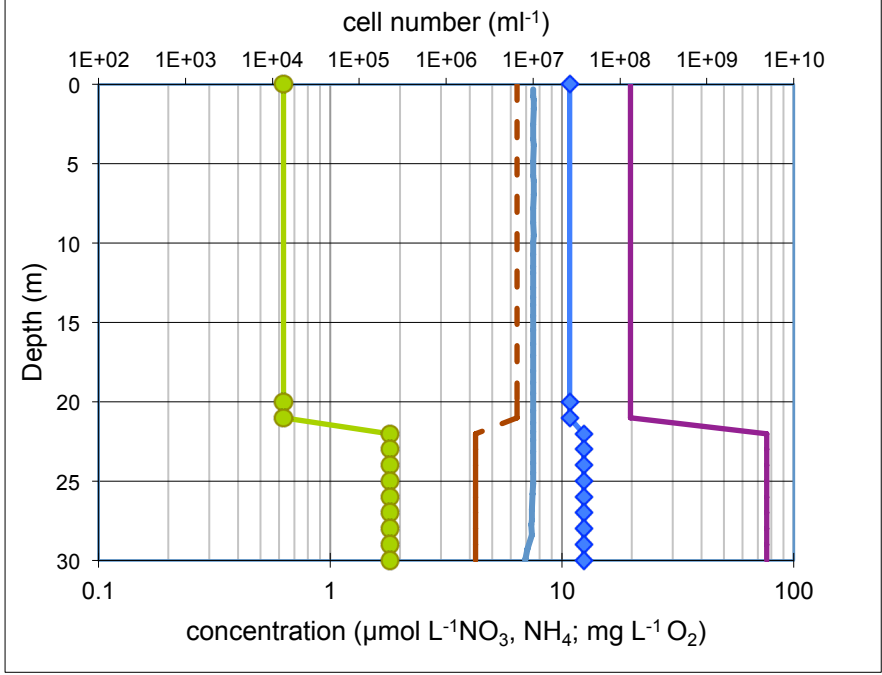












- *nirS* cell number
- ◆ *16S rRNA* cell number
- $\text{NH}_4\text{-N}$ ($\mu\text{g l}^{-1}$)
- - $\text{NO}_3\text{-N}$ ($\mu\text{g l}^{-1}$)
- O_2 (mg l^{-1})