Supporting Information

Macro-invertebrate response to phosphorus levels in Dutch inland waters

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Additional information on abundance data derived from Limnodata Neerlandica

1. Number of abundance data per log C_P interval

348 903 genera abundance records are distributed over log C_P intervals (log units of 0.1 mg/L) according to Figure S1.

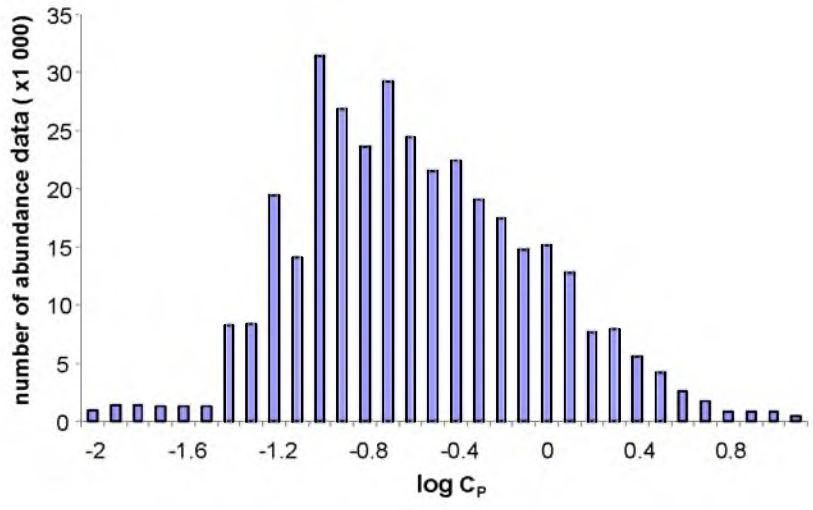

Figure S1 Number abundance data varies with the phosphorus concentration

2. Number of macro-invertebrate genera per abundance range

The number of genera that were counted for abundance numbers in ranges as indicated in the top row of Table S1, are subdivided in phosphorus concentration intervals (first column). Table S1 demonstrates that intervals between 0.1 and 1 mg/l have optimal (maximum number of genera are bold printed). Figure S2 shows that more than 300 genera have only abundance numbers lower than 10.

Table S1 Number of macro-invertebrate genera occurring at 9 abundance ranges (> 3 000 means the abundance of a genus was higher than 3000) and C_P intervals.

C_P (mg/l)	>3 000	≥1 000 <3 000	≥300 <1 000	≥100 <300	≥30 <100	≥10 <30	≥3 <10	≥1 <3	0
0.002 - 0.005	2	2	5	7	9	9	31	17	785
0.005- 0.013	2	2	3	11	32	45	74	87	611
0.013 - 0.020	2	7	12	33	68	76	85	95	489
0.020 - 0.032	1	6	16	38	79	66	110	94	457
0.032 - 0.04	5	14	25	50	95	105	99	96	378
0.04 - 0.05	8	10	26	57	83	93	106	92	392
0.05 - 0.06	3	16	34	52	83	104	105	95	375
0.06 - 0.08	8	11	41	**85**	98	99	107	83	335
0.08 - 0.10	9	25	45	76	111	92	119	98	292
0. 10 - 0.13	8	14	49	71	107	**113**	114	102	289
0.13 - 0.16	9	19	38	78	106	105	107	**118**	287
0.16 - 0.20	11	19	**59**	78	96	110	110	103	281
0.20 - 0.25	13	22	49	62	**121**	95	**120**	105	**280**
0.25 - 0.32	12	20	58	71	100	96	111	115	284
0.32 - 0.40	**15**	25	39	78	82	88	113	111	316
0.40 - 0.50	9	**27**	47	64	88	89	110	113	320
0.50 - 0.63	10	20	44	77	83	71	106	103	353
0.63 - 0.8	12	15	32	60	84	90	100	100	374
0.8 - 1.0	5	13	32	40	70	80	80	91	456
1.0 - 1.3	7	16	33	45	71	64	81	98	452
1.3 - 1.6	9	16	32	41	62	80	93	65	469
1.6 - 2.0	10	13	34	38	75	56	87	82	472
2.0 - 2.5	11	11	30	54	53	68	77	71	492
2.5 - 3.2	8	15	23	39	62	50	61	70	539
3.2 - 4.0	5	14	20	28	39	39	66	77	579
4.0 – 5.0	2	8	17	23	44	54	65	63	591
5.0 - 6.3	1	9	12	19	44	38	61	61	622
6.3 - 7.9	1	6	15	19	26	35	51	47	667
8 - 10	0	4	9	8	20	27	34	40	725
10 - 40	1	2	8	7	14	26	33	51	725

The maximum number of macroinvertebrate genera in all abundance ranges appears for C_P roughly between of 0.1 and 0.5 mg/l. Not surprisingly, the minimum number of *absent* macroinvertebrate

genera (280) occurs within that C_P range (0.20 - 0.25 mg/l).

Table S2 Monitored concentration of total phosphorus (mg/l yearly average) in Meuse (Eijsden), Rhine (Lobith) and Scheldt (Schaar van Oude Doel)

year	Meuse	Rhine	Scheldt
1970	0.43	0.5	
1971	0.94	0.95	
1972	0.63	0.9	1.1
1973	1.25	0.98	1.6
1974	1.01	0.83	1.56
1975	0.73	0.73	1.03
1976	0.99	0.96	1.2
1977	0.64	0.77	1.4
1978	0.69	0.74	1.12
1979	0.9	0.73	1.16
1980	0.58	0.66	1.17
1981	0.46	0.60	1.11
1982	0.51	0.56	1.02
1983	0.53	0.59	0.86
1984	0.5	0.57	0.99
1985	0.58	0.62	1.07
1986	0.54	0.52	0.95
1987	0.46	0.38	0.9
1988	0.54	0.343	0.98
1989	0.51	0.343	0.9
1990	0.51	0.295	0.66
1991	0.54	0.27	0.64
1992	0.42	0.24	0.63
1993	0.56	0.23	0.5
1994	0.54	0.21	0.59
1995	0.32	0.2	0.45
1996	0.47	0.22	0.52
1997	0.46	0.21	0.44
1998	0.38	0.21	0.49
1999	0.36	0.18	0.43
2000	0.30	0.18	0.44
2001	0.22	0.11	0.21
2002	0.32	0.22	0.52
2003	0.34	0.22	0.4
2004	0.35	0.21	
2005	0.34	0.15	

A considerable number of genera (303 of the 867) appeared rare as these genera occurred less than 10 times in the whole database. Figure S2 shows the number of genera per abundance range. This implies that in at least 30 out of 40 C_P intervals a genus with this rate of occurrence is absent.

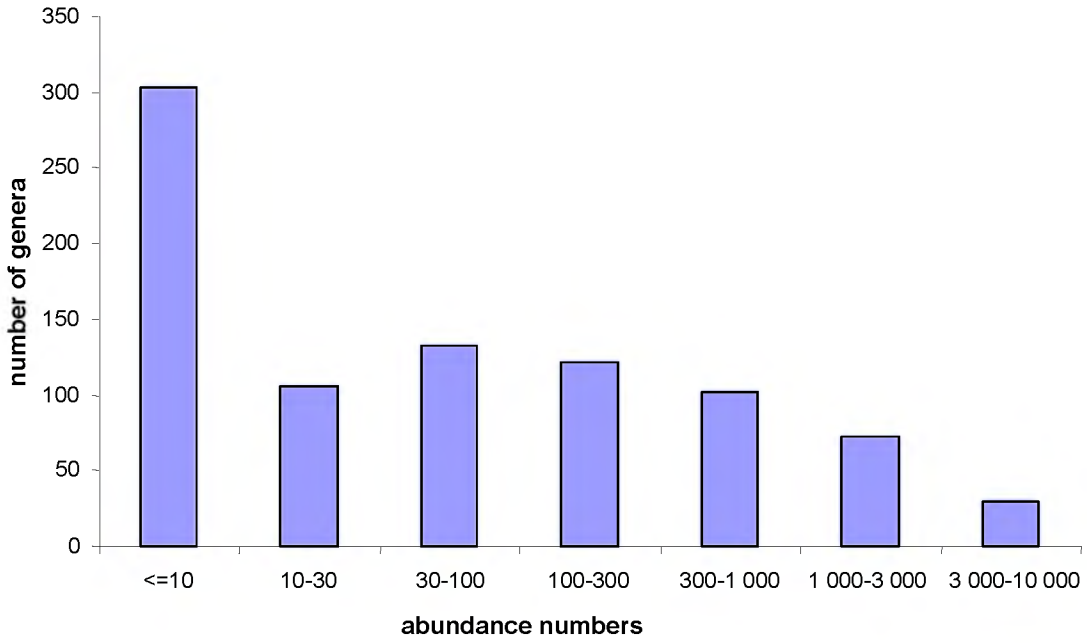

Figure S2 Number of genera versus abundance ranges