

**AN ASSESSMENT OF THE USE OF *BACILLARIOPHYCEAE* AS BIOLOGICAL
MONITORS OF HEAVY METAL POLLUTION IN AUSTRALIAN TROPICAL
STREAMS**

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Ph.D. dissertation

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APPENDICES

Appendix 1: Site observations and water chemistry measurements

Code	Site	WATER MEASUREMENTS					STREAM OBSERVATIONS							BOTTOM SUBSTRATUM %				VEGETATION %				
		pH	Do %	Temp °C	EC µScm	Turb	Flow	Foam/ scum	Oil	Clarity	Salts	Shade	Fish	Sand/ silt	Gravel/ rock	Algae	Snags	Trees >10m	Trees <10m	Shrubs	Grasses	Soil/rock/ tailings
1	RJI1	3.42	101.4	34.0	5635.0	0.0	2	1	1	1	3	0	1	3	90	5	2	0	2	3	5	90
2	RJI2	4.04	6.7	26.8	2776.0	0.0	2	1	1	2	2	0	1	0	0	100	0	0	15	10	20	55
3	RJI3	3.65	82.7	30.7	1407.0	31.0	2	3	2	3	2	1	1	0	0	100	0	30	15	10	40	5
4	RJI4	4.42	90.0	30.4	611.0	0.2	1	1	2	2	2	1	2	0	0	100	0	15	20	10	50	5
5	RJI5	6.20	131.0	25.5	2525.0	0.0	2	1	2	2	2	1	1	0	0	100	0	15	15	5	20	45
6	RJI6	6.31	120.0	26.5	420.0	0.0	2	4	2	2	1	2	1	0	90	5	5	25	25	0	35	15
7	RJI7	7.27	118.2	29.0	533.0	0.0	2	3	1	2	1	1	2	25	25	45	5	30	30	10	20	10
8	RJI8	7.03	75.7	27.7	433.0	4.2	2	2	2	2	2	2	2	20	50	25	5	15	20	10	50	5
9	RJI9	7.30	83.9	27.0	365.0	0.0	2	1	1	2	1	2	2	75	4	20	1	25	25	10	10	30
10	RJI10	6.97	87.6	27.3	92.0	1.1	2	1	1	2	1	2	2	60	20	5	5	35	25	5	5	30
11	RJC1	7.21	79.5	26.3	133.0	0.5	2	1	1	2	1	2	2	20	30	10	5	30	30	15	5	20
12	RJC2	7.37	73.0	26.0	260.0	0.0	2	1	1	3	1	3	2	10	80	5	5	30	10	0	50	10
13	RJC3	7.39	70.0	27.0	170.0	6.7	2	1	1	3	1	2	2	85	5	5	5	45	25	15	10	5
14	RJC4	7.57	84.2	26.2	267.0	8.4	2	1	1	2	1	3	2	5	80	10	5	30	30	30	10	0
15	RJC5	8.19	101.8	27.9	101.8	3.9	2	1	1	2	1	2	2	40	35	20	5	10	40	10	40	0
16	TGI1	6.34	57.6	28.3	38.0	141.0	1	2	3	3	1	3	2	0	90	5	5	30	20	10	30	10
17	TGI2	6.44	59.5	28.7	92.0	49.0	1	2	2	2	1	3	2	0	90	5	5	10	30	20	10	30
18	TGI3	6.11	58.8	28.8	138.0	77.0	2	2	3	2	1	4	2	0	90	5	5	0	30	20	20	30
19	TGI4	7.58	92.2	32.0	842.0	42.0	1	1	1	2	1	1	1	65	25	5	5	0	20	10	60	10
20	TGI5	4.90	56.1	26.7	293.0	51.0	2	2	2	3	1	3	1	40	40	10	10	25	10	10	60	5
21	TGI6	6.81	50.9	26.0	126.0	128.0	2	2	2	3	1	2	2	40	40	10	10	30	15	15	30	10
22	TGC1	7.05	57.4	26.9	42.0	111.0	1	2	2	3	1	2	2	0	90	5	5	30	30	20	20	0
23	TGC2	6.98	68.4	31.0	75.0	111.0	2	2	2	3	1	3	2	45	45	5	5	25	20	10	25	20

RUM JUNGLE MINE

TOMS GULLY MINE

Code	Site	WATER MEASUREMENTS					STREAM OBSERVATIONS							BOTTOM SUBSTRATUM %				VEGETATION %				
		pH	Do %	Temp °C	EC µscm	Turb	Flow	Foam/ scum	Oil	Clarity	Salts	Shade	Fish	Sand/ silt	Gravel/ rock	Algae	Snags	Trees >10m	Trees <10m	Shrubs	Grasses	Soil/rock/ tailings
24	HCUSEC	3.56	110.0	30.1	1345.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	ECDSHC	4.35	91.0	30.5	340.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	ECUS12MC	4.47	92.8	30.5	383.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	12MCDSEC	5.45	98.0	27.3	106.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	12MCUSSC	8.43	106.3	31.0	411.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	SCDS12MC	8.70	93.0	30.2	589.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	SC@BRX	7.56	93.3	30.0	598.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	12MCUSEC	6.89	100.0	28.7	15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	ECUSBRX	5.99	100.0	30.0	23.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	CCUSSC	8.20	86.2	26.5	767.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	SCUSCC	8.40	97.6	29.8	728.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	SCDSCC	8.37	93.0	29.0	733.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	SCUS12MC	8.43	97.3	27.8	694.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	CHI1	2.95	58.6	29.0	1120.0	23.6	2	2	2	2	3	1	1	40	20	40	0	0	15	0	75	10
38	CHI2	4.05	132.0	29.0	515.0	46.9	1	2	2	2	1	1	1	5	80	5	0	15	15	0	50	20
39	CHI3	4.33	115.0	31.3	5280.0	79.0	2	2	2	2	1	1	1	5	0	90	5	10	10	0	70	10
40	CHI4	4.85	130.7	28.1	521.0	25.0	2	2	3	1	2	1	1	45	45	5	5	0	15	10	70	5
41	CHI5	6.95	100.3	25.6	1070.0	86.0	2	2	2	2	1	3	2	5	80	10	5	10	20	0	70	0
42	CHI6	5.50	88.7	28.5	771.0	36.7	2	1	2	1	1	1	1	70	10	10	10	10	10	0	80	0
43	CHI7	7.28	83.4	29.3	452.0	58.0	2	2	2	3	1	3	2	25	25	25	25	25	20	5	40	10
44	CHI8	6.99	49.8	31.3	426.0	1000.0	1	2	2	3	1	2	2	15	60	15	10	25	15	15	35	10
45	BKI1	7.15	72.0	28.0	119.0	286.0	1	2	2	3	1	2	1	80	5	5	10	30	20	0	20	30
46	BKI2	6.94	114.4	30.0	119.0	124.0	1	2	2	3	1	2	2	80	5	5	10	20	15	0	55	10
47	CHC1	7.32	75.3	25.1	58.0	336.0	1	1	1	3	1	3	2	5	85	5	5	5	10	10	75	0
48	CHC2	7.72	74.2	26.7	183.0	764.0	1	2	1	3	1	3	2	5	85	5	5	10	10	10	60	10
49	CHC3	7.23	80.9	28.3	59.0	330.0	1	1	1	3	1	2	2	5	85	5	5	5	15	5	75	0
50	CHC4	7.45	48.3	27.3	208.0	533.0	1	2	1	3	1	3	2	35	45	10	10	10	10	5	70	5

REDBANK MINE

COSMO HOWLEY MINE

Appendix 2: Site water chemistry

Site	METALS (filtered)															NUTRIENT ANALYSIS				
	CaCO ₃ mg/L	Al mg/L	Ca mg/L	Cd mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	Zn mg/L	S04 mg/L	N mg/L	TKN mg/L	TN mg/L	TP mg/L	TOC mg/L
RJI1	0.500	18.600	320.000	0.028	5.040	5.990	20.700	2.890	1100.000	9.680	5.150	4.300	0.015	8.050	4600.000	0.100	1.200	1.300	0.050	0.500
RJI2	0.500	21.300	152.000	0.029	11.300	11.500	23.400	1.500	406.000	19.700	5.140	7.970	0.030	13.800	2030.000	0.040	0.500	0.500	0.030	0.500
RJI3	0.500	2.170	22.800	0.005	1.600	1.220	1.210	0.990	69.000	2.980	3.870	1.340	0.030	2.510	350.000	0.050	0.400	0.400	0.030	0.500
RJI4	0.500	2.690	26.600	0.005	1.730	1.430	0.770	1.010	78.600	3.190	4.120	1.470	0.015	2.700	390.000	0.080	0.500	0.600	0.005	0.500
RJI5	0.500	2.330	62.300	0.006	2.010	0.191	0.110	1.030	124.000	3.770	9.410	1.700	0.015	3.170	660.000	0.250	0.800	1.000	0.005	0.500
RJI6	23.000	0.040	24.000	0.002	0.734	0.601	0.341	0.710	54.300	1.560	5.430	0.600	0.015	1.120	280.000	0.040	0.300	0.300	0.005	0.500
RJI7	52.000	0.010	36.000	0.002	0.250	0.045	0.060	0.740	60.700	0.785	7.220	0.220	0.015	0.320	280.000	0.050	0.200	0.200	0.005	2.000
RJI8	51.000	0.005	29.000	0.002	0.095	0.053	0.270	0.940	48.400	0.415	6.520	0.100	0.015	0.230	220.000	0.050	0.600	0.600	0.005	1.000
RJI9	79.000	0.005	24.300	0.002	0.039	0.022	0.040	0.900	38.100	0.200	5.060	0.050	0.015	0.070	150.000	0.030	0.400	0.400	0.020	1.000
RJI10	39.000	0.005	4.420	0.001	0.004	0.003	0.310	0.400	7.180	0.033	2.450	0.015	0.015	0.080	6.000	0.070	0.200	0.300	0.040	2.000
RJC1	67.000	0.005	7.000	0.001	0.002	0.011	0.390	0.900	11.200	0.038	3.290	0.015	0.015	0.050	0.050	0.080	0.900	1.000	0.005	1.000
RJC2	124.000	0.005	11.700	0.001	0.014	0.013	0.248	0.270	33.900	0.051	3.470	0.015	0.015	0.030	44.000	0.020	0.500	0.500	0.005	1.000
RJC3	116.000	0.010	13.100	0.001	0.016	0.002	0.340	0.660	18.400	0.028	3.260	0.015	0.015	0.005	0.100	0.100	0.600	0.700	0.005	3.000
RJC4	136.000	0.060	15.800	0.004	0.003	0.018	0.280	1.560	21.700	0.023	3.330	0.015	0.015	0.090	0.100	0.050	0.500	0.500	0.005	2.000
RJC5	98.000	0.010	10.600	0.001	0.002	0.003	0.080	0.150	15.900	0.007	2.060	0.015	0.015	0.005	0.050	0.030	0.600	0.600	0.020	0.500
TGI1	17.000	0.005	1.840	0.002	0.002	0.005	0.292	1.010	1.520	0.229	5.670	0.015	0.015	0.010	2.000	0.040	0.300	0.300	0.005	0.500
TGI2	16.000	0.030	8.980	0.001	0.002	0.005	0.244	1.320	5.610	0.174	4.960	0.015	0.015	0.030	33.000	0.020	0.300	0.300	0.005	0.500
TGI3	10.000	0.100	19.300	0.006	0.025	0.011	0.197	2.120	13.600	1.000	7.430	0.070	0.015	0.330	110.000	0.050	0.400	0.400	0.005	0.500
TGI4	35.000	0.210	122.000	0.003	0.006	0.009	0.245	9.650	57.600	0.746	29.400	0.060	0.015	0.080	440.000	0.020	0.300	0.300	0.005	1.000
TGI5	0.500	0.940	27.600	0.016	0.067	0.110	0.265	2.870	18.600	2.920	10.300	0.120	0.015	0.600	170.000	0.030	0.300	0.300	0.020	0.500
TGI6	20.000	0.005	9.780	0.001	0.007	0.002	0.268	2.170	7.970	0.513	6.950	0.015	0.015	0.040	51.000	0.050	0.500	0.500	0.005	0.500
TGC1	33.000	0.070	8.640	0.001	0.002	0.014	0.981	1.750	3.270	0.091	5.480	0.015	0.015	0.130	0.050	0.240	0.900	1.100	0.030	8.000
TGC2	21.000	0.005	2.470	0.001	0.004	0.007	0.105	1.240	1.970	0.017	5.980	0.015	0.015	0.005	3.000	0.060	0.500	0.600	0.005	1.000

RUM JUNGLE MINE

TOMS GULLY MINE

Site	METALS (filtered)															NUTRIENT ANALYSIS				
	CaCO3 mg/L	Al mg/L	Ca mg/L	Cd mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	Zn mg/L	S04 mg/L	N mg/L	TKN mg/L	TN mg/L	TP mg/L	TOC mg/L
HCUSEC	0.000	20.900	44.900	-	3.620	97.800	0.200	5.300	113.000	7.510	6.600	1.570	-	0.619	836.000	-	-	-	-	-
ECDSHC	5.000	1.390	11.200	-	0.561	14.600	0.100	2.300	26.100	1.170	5.300	0.242	-	0.092	198.000	-	-	-	-	-
ECUS12MC	5.000	0.792	13.500	-	0.529	14.900	0.040	3.800	28.400	0.906	6.200	0.261	-	0.100	219.000	-	-	-	-	-
12MCDSEC	15.000	0.023	2.600	-	0.076	1.410	0.020	0.800	4.700	0.145	2.900	0.038	-	0.014	22.800	-	-	-	-	-
12MCUSSC	200.000	0.014	29.900	-	0.015	0.231	0.040	2.800	29.700	0.255	9.900	0.007	-	0.002	16.100	-	-	-	-	-
SCDS12MC	265.000	0.008	37.200	-	0.007	0.109	0.040	3.900	43.000	0.111	20.800	0.003	-	0.001	8.400	-	-	-	-	-
SC@BRX	300.000	0.008	40.500	-	0.004	0.046	0.060	3.900	43.600	0.292	20.900	0.003	-	0.001	9.300	-	-	-	-	-
12MCUSEC	15.000	0.017	0.900	-	0.001	0.041	0.160	0.600	1.300	0.008	2.700	0.001	-	0.002	1.400	-	-	-	-	-
ECUSBRX	10.000	0.153	0.300	-	0.008	0.281	0.120	0.200	0.600	0.018	2.200	0.004	-	0.002	0.100	-	-	-	-	-
CCUSSC	380.000	0.008	43.900	-	0.000	0.010	0.020	5.200	57.100	0.020	18.900	0.000	-	0.002	6.700	-	-	-	-	-
SCUSCC	380.000	0.006	42.400	-	0.000	0.002	0.040	4.300	53.500	0.015	29.000	0.000	-	0.000	6.300	-	-	-	-	-
SCDSCC	360.000	0.008	41.900	-	0.000	0.106	0.040	4.300	53.600	0.013	28.600	0.000	-	0.001	5.700	-	-	-	-	-
SCUS12MC	0.000	0.002	28.700	-	0.000	0.001	0.020	3.000	34.600	0.001	18.800	0.000	-	0.001	5.100	-	-	-	-	-
CHI1	0.500	847.000	231.000	0.089	15.000	12.200	223.000	4.110	2000.000	262.000	27.300	19.900	0.320	7.240	26000.000	0.005	4.300	4.300	0.020	8.000
CHI2	0.500	7.100	10.400	0.001	0.249	0.157	0.288	1.670	59.600	5.860	15.300	0.250	0.015	0.110	370.000	0.005	0.200	0.200	0.005	0.500
CHI3	23.000	3.410	473.000	0.001	0.280	0.016	3.020	6.180	1100.000	15.800	161.000	0.350	0.015	0.310	7200.000	0.050	0.400	0.400	0.005	2.000
CHI4	0.500	1.590	13.200	0.001	0.328	0.336	0.197	2.590	75.500	3.380	9.040	0.390	0.015	0.160	380.000	0.010	0.200	0.200	0.005	0.500
CHI5	55.000	0.005	46.200	0.001	0.008	0.002	0.007	2.690	145.000	1.610	58.600	0.015	0.015	0.005	890.000	0.005	0.300	0.300	0.005	1.000
CHI6	1.000	0.690	17.000	0.001	0.251	0.231	0.274	2.600	81.700	3.120	14.800	0.310	0.015	0.140	1200.000	0.005	0.300	0.300	0.005	0.500
CHI7	86.000	0.005	13.400	0.001	0.004	0.005	0.229	1.590	51.400	0.451	32.200	0.015	0.015	0.010	220.000	0.005	0.400	0.400	0.005	3.000
CHI8	64.000	0.005	8.810	0.001	0.002	0.004	0.050	1.730	28.300	0.360	24.600	0.015	0.015	0.020	130.000	0.005	0.600	0.600	0.010	3.000
BKI1	72.000	0.120	5.270	0.001	0.004	0.003	0.545	3.200	7.750	0.106	16.700	0.015	0.015	0.140	4.000	0.010	0.800	0.800	0.040	7.000
BKI2	44.000	0.010	2.740	0.001	0.008	0.010	0.245	1.370	9.370	0.134	15.300	0.015	0.015	0.090	27.000	0.005	0.600	0.600	0.005	3.000
CHC1	0.500	0.090	0.980	0.001	0.005	0.002	0.138	2.240	1.970	0.012	8.490	0.015	0.015	0.030	0.050	0.100	0.600	0.700	0.005	6.000
CHC2	88.000	0.005	10.500	0.001	0.003	0.001	0.010	1.500	9.830	0.003	11.000	0.015	0.015	0.005	2.000	0.005	0.500	0.500	0.005	1.000
CHC3	24.000	0.230	1.320	0.002	0.006	0.002	0.159	0.920	1.670	0.010	7.800	0.015	0.015	0.010	0.300	0.020	0.900	0.900	0.100	3.000
CHC4	101.000	0.005	3.230	0.003	0.002	0.004	0.762	1.550	12.000	0.050	23.300	0.015	0.015	0.040	0.050	0.005	0.600	0.600	0.040	4.000

REDBANK MINE

COSMO HOWLEY MINE

Appendix 3: Field work sheets

Water Quality

Date: _____ **Time:** _____

Site Code: **Site Name:**

Reference Site: yes no **Water Course:**

GPS northing: _____ **easting:** _____

Distance from point source: _____

pH	_____	units
D.O.	_____	%
Temp	_____	°C
E.C.	_____	uScm ⁻¹
Turbidity	_____	NTUs

Diatom Sampling

Substrate:

Site Code and Replicate Number

Epilithon -
(rock)

Stream Observations

Flowing: Yes No

Riffle / Run / Other (describe)

Pool / Backwater / Other (describe).....

Foam/Scum	1 none	2 pollen/leaves	4 algal scum	4 foam	5 other
Water oil	1 none	2 sheen	3 slick	4 globbs	5 other
Water clarity	1 clear >1.5m	2 good 0.3-1.5m	3 fair 0.1-0.3m	4 poor zero vis.	
Salts	1 none	2 some	3 lots		
% shade cover	0 <5%	1 5-25%	2 26-50%	3 51-75%	4 >76%

Fish: **no** **yes** (5 min observation)

Other wildlife: (eg feral and pastoral animals – scats, digging, footprints?)

Bottom Sand/silt bed _____% Algae _____%

Substratum: Gravel/ rock bed _____% Snags _____%

 Riffle _____% Pool/edge/unknown _____%

Riparian vegetation:

Vegetation Type	%cover	Description
Trees >10m		
Trees <10m		
Shrubs		
Grasses/sedge		
None (soil/rock/mine tailing)		

Comments:

Appendix 4: Species list, codes and taxonomic authorities

Genus	Species	Code	Taxonomic authority
Achnantheidium	exigua	Ac.ex	Grunow
	cf exilis v. gracilis	Ac.evg	Kützing
	minutissima v. exilis	Ac.mve	Kützing
	minutissima v jackii	Ac.mvj	(Rabenhorst) Lange-Bertalot
	minutissima v minutissima	Ac.mvm	Kützing
	cf minutissima v. scotia	Ac.mvs	(Carter) Lange-Bertalot
	cf saxonica	Ac.sc	Krasske
Adalfia	cf miniscula	Ad.mi	(Grunow) Lange-Bertalot
Amphora	libyca	Am.li	Ehrenberg
Aulacoseira	distans	Au.di	(Ehrenberg) Simonsen
	granulata	Au.gr	(Ehrenberg) Simonsen
Bacillaria	paradoxa	Ba.pa	Gmelin
Brachysira	brebissonii	Br.br	Ross
	cf macroserians	Br.ma	Metzeltin & Lange-Bertalot
	neoactea nov. spec.	Br.ne	Lange-Bertalot
	neoexilis	Br.neo	Lange-Bertalot
	styriaca	Br.st	(Grunow) Ross
	spec 1	Br.sp1	-
Caloneis	cf bacillum	Ca.ba	(Grunow) Cleve
	spec 2	Ca.sp2	-
	spec 3	Ca.sp3	-
	spec 4	Ca.sp4	-
	spec 5	Ca.sp5	-
Chameapinnularia	mediocris	Ch.me	(Krasske) Lange-Bertalot
Cocconeis	placentula	Co.pl	Ehrenberg
Craticula	acidoclinata	Cr.ac	Lange-Bertalot & Metzeltin
	ambigua	Cr.am	(Ehrenberg) Man
	halophila	Cr.ha	(Grunow) Man
	halophilioides nov. comb.	Cr.hal	(Hustedt) Lange-Bertalot
Cyclotella	meneghiniana	Cyc.me	Kützing
	stelligera	Cyc.st	Cleve & Grunow
Cymbella	cf wolterecki	Cyc.wo	Hustedt
	cf aspera	Cy.as	(Ehrenberg) Cleve
	cistula	Cy.ci	(Ehrenberg) Kirchner
	cymbiformis	Cy.fo	(Agardh & Kützing) Van Heurck
	excisa	Cy.ex	Kützing
	hustedtii fo. stigmata	Cy.hu	Compere
	subhelvetica	Cy.su	Krammer
	Diadesmis	confervacea	Di.co
	confervaceoides	Di.con	Lange-Bertalot
Diploneis	pseudovalis	Dip.ps	Hustedt
Encyonema	Nr 133/20	En.nr	Lange-Bertalot
	minutum	En.mi	(Hilse) D. G. Mann
	neomesianum	En.ne	Krammer
	riotecense	En.ri	Krammer
	silesiacum	En.si	(Bleisch) D. G. Mann
	silesiacum group 2	En.sil	-
	spec 6	En.sp6	-
Encyonopsis	cf floridana	Eny.fl	Krammer nov. spec.
	perborealis nov. spec.	Eny.pe	Krammer
	subrutneri nov. spec.	Eny.su	Krammer
	subspicula nov. spec.	Eny.sub	Krammer
	spec 7	Eny.sp7	-
Epithemia	adnata	Ep.ad	(Kützing) Brebissoni

Genus	Species	Code	Taxonomic authority	
Eunotia	cf cistula	Ep.ci	(Ehrenberg) Ralfs	
	cf asterionelloides	Eu.as	Hustedt	
	bilunaris	Eu.bi	(Ehrenberg) Mills	
	camelus v. camelus	Eu.cvc	Ehrenberg	
	camelus v. denticulata	Eu.cvd	Grunow	
	camelus v. didymodon	Eu.cvdi	Grunow	
	cf faba	Eu.fa	Ehrenberg	
	cf femoriformis	Eu.fe	(Patrick) Hustedt	
	formica	Eu.fo	Ehrenberg	
	cf gracilis	Eu.gr	W. Smith	
	longicollis nov. spec.	Eu.lo	Lange-Bertalot	
	cf mondon	Eu.mo	Ehrenberg	
	naegelii	Eu.na	migula	
	pectinalis	Eu.pe	(Dillwyn) Rabenhorst	
	pectinalis v. undulata	Eu.pvu	(Ralfs) Rabenhorst	
	cf rabenhorstiana	Eu.ra	(Grunow) Hustedt	
	rabenhorstii v. africana f. triodon	Eu.rva	Hustedt	
	cf septentrionalis	Eu.se	Ostrup	
	serpentina	Eu.ser	Ehrenberg	
	cf silvae nov. spec.	Eu.si	Lange-Bertalot	
	cf silvae group 2	Eu.si2	-	
	soleirolii	Eu.so	(Kützing) Rabenhorst	
	cf transfuga nov. spec.	Eu.tr	Lange-Bertalot	
	trinacria v. undulata	Eu.tri	Hustedt	
	veneris	Eu.ve	(Kützing) De Toni	
	spec 8	Eu.sp8	-	
	spec 9	Eu.sp9	-	
	spec 10	Eu.sp10	-	
	spec 11	Eu.sp11	-	
	spec 12	Eu.sp12	-	
	spec 13	Eu.sp13	-	
	spec 14	Eu.sp14	-	
	Fallacia	tenera	Fa.te	(Hustedt) D. G. Mann
	Fragillaria	brevistriata	Fr.br	Grunow
capucina		Fr.ca	Desmazieres	
pinnata v. pinnata		Fr.pvp	Ehrenberg	
Frustulia	tenera	Fr.te	(W. Smith) Lange-Bertalot	
	ambigua	Fru.am	(Ehrenberg) D.G, Mann ex Round	
	crassinervia	Fru.cr	(Brebisson) Lange-Bertalot & Krammer	
Gomphonema	rhomboides	Fru.rh	(Ehrenberg) De Toni	
	cf affine	Go.af	Kützing	
	affine v. affine	Go.ava	Kützing	
	agur v. turris	Go.avt	(Ehrenberg) Lange-Bertalot	
	cf clavatum	Go.cl	Ehrenberg	
	cf exilissimum	Go.ex	(Grunow) Lange-Bertalot & Reichardt	
	cf exilissimum group 2	Go.ex2	-	
	gracile	Go.gr	Ehrenberg	
	gracile group 2	Go.gr2	-	
	innocens	Go.in	Reichardt	
	cf kobayashiae nov. spec.	Go.ko	Lange-Bertalot	
	lagenula	Go.la	Kützing	
	parvulum	Go.pa	(Kützing) Kützing	
	punae nov. spec.	Go.pu	Lange-Bertalot	
	cf vibrioides	Go.vi	Reichardt & Lange-Bertalot	
	spec 15	Go.sp15	-	

Genus	Species	Code	Taxonomic authority
	spec 16	Go.sp16	-
	spec 17	Go.sp17	-
	spec 18	Go.sp18	-
	spec 19	Go.sp19	-
Gyrosigma	acuminatum	Gy.ac	(Kützing) Rabenhorst
Hantzschiana	amphioxys	Ha.am	(Ehrenberg) W. Smith
	cf amphioxys v. major	Ha.avm	Grunow
	amphioxys v. vivax	Ha.avv	(Ehrenberg) Grunow
Koboyasia	cf nov. spec. Nr 941/6-9	Ko.sp	Metzeltin & Lange-Bertalot
Lemnicola	hungarica	Le.hu	(Grunow) Round & Basson
Luticola	geoppertiana	Lu.ge	(Bleisch) D. G. Mann
	mutica	Lu.mu	(Kützing) Mann
	cf spec Nr 87/16-19	Lu.sp	Metzeltin & Lange-Bertalot
Mastogloia	elliptica v. dansei	Ma.el	(Thwaites) Grunow
Mayamea	agrestis	May.ag	(Hustedt) Lange-Bertalot
	eolimna minima	May.eo	(Grunow) Lange-Bertalot
	atomas v. permitus	May.avp	(Hustedt) Lange-Bertalot
Navicula	angusta	Na.an	Grunow
	arvensis v. maior	Na.avm	Lange-Bertalot
	bryophila	Na.br	Peterson
	cinta f. minuta	Na.ci	Grunow
	crucicula	Na.cr	(Grun. ex Cl) Ross
	cryptocephala	Na.cry	Kützing
	cryptotenella	Na.cryp	Lange-Bertalot
	difficillima	Na.di	Hustedt
	gerloffii	Na.ge	Schimanski
	gerloffii G2	Na.ge2	-
	glomus	Na.gl	Carter & Bailey-Watts
	gregaria	Na.gr	Donkin
	heimansioides	Na.he	Lange-Bertalot
	helvetica	Na.hel	Brun
	leptostriata	Na.le	Joergensen
	cf longicephala	Na.lo	Hustedt
	cf namibica	Na.na	Lange-Bertalot & Rumrich
	notha	Na.no	Wallace
	podzorskii	Na.po	Lange-Bertalot
	radiosa	Na.ra	Kützing
	rostellata	Na.ro	Kützing
	schadei	Na.sc	Krasske
	schroeteri	Na.sch	Meister
	seminulum	Na.se	Grunow
	subtilissima	Na.su	Cleve
	cf tenelloides	Na.te	Hustedt
	cf tenerrima	Na.ten	Hustedt
	tridentulata	Na.tr	Krasske
	variostrata	Na.va	Krasske
	veneta	Na.ve	Kützing
	vitabunda	Na.vi	Hustedt
	spec 20	Na.sp20	-
	spec 21	Na.sp21	-
	spec 22	Na.sp22	-
	spec 23	Na.sp23	-
	spec 24	Na.sp24	-
	spec 26	Na.sp26	-
	spec 27	Na.sp27	-

Genus	Species	Code	Taxonomic authority
	spec 28	Na.sp28	-
	spec 29	Na.sp29	-
	spec 30	Na.sp30	-
	spec 31	Na.sp31	-
	spec 32	Na.sp32	-
Naviculadicta	chilensis	Nad.ch	(Krasske) Lange-Bertalot
	cf stauroneoides	Nad.st	Lange-Bertalot
Neidium	cf affine	Ne.af	(Ehrenberg) Pfitzer
	amphigomphus	Ne.am	(Ehrenberg) Pfitzer
	ampliatum	Ne.amp	(Ehrenberg) Krammer
	dubium	Ne.de	(Ehrenberg) Cleve
	spec 33	Ne.sp33	-
Nupela	spec 34	Nu.sp34	-
Nitzschia	aequorea	Ni.ae	Hustedt
	agnita	Ni.ag	Hustedt
	amphibia	Ni.am	Grunow
	cf angustata	Ni.an	Grunow
	archibaldii	Ni.ar	Lange-Bertalot
	dissipata v. dissipata	Ni.dvd	(Kützing) Grunow
	fontifuga	Ni.fo	Cholnoky
	gracilis	Ni.gr	Hantzsch
	cf hantzschiana	Ni.ha	Rabenhorst
	intermedia	Ni.in	Hantzsch
	liebetruithii	Ni.lie	Rabenhorst
	liebetruithii v. major	Ni.lvm	Grunow
	linearis	Ni.lin	(Agardh) W. Smith
	microcephala	Ni.mi	(Grunow in Cleve & Moller)
	nana	Ni.na	Grunow
	palea v. palea	Ni.pvp	(Kützing) W. Smith
	palea v. tenuirostris	Ni.pvt	Grunow
	paleaeformis	Ni.pa	Hustedt
	cf pellucida	Ni.pe	(Grunow) Hustedt
	perminuta	Ni.per	(Grunow) M. Peragallo
	cf pseudofonticola	Ni.ps	Hustedt
	pumila	Ni.pu	Hustedt
	reversa	Ni.re	W. Smith
	cf rosenstockii	Ni.ro	Lange-Bertalot
	sigmoidea	Ni.si	(Nitzsch) W, Smith
	solita	Ni.so	Hustedt
	subacicularis	Ni.su	Hustedt
	cf tropica	Ni.tr	Hustedt
	vasta	Ni.va	Hustedt
	spec 35	Ni.sp35	-
	spec 36	Ni.sp36	-
	spec 37	Ni.sp37	-
	spec 38	Ni.sp38	-
	spec 39	Ni.sp39	-
	spec 25	Ni.sp25	-
Pinnularia	acrosphaeria	Pi.ac	W. Smith
	cf brauniani	Pi.br	(Grunow) Mills
	butantanum nov. comb.	Pi.bu	(Krasske) Metzeltin
	cf dispar nov. spec.	Pi.di	Metzeltin & Krammer
	divergens	Pi.div	W. Smith
	divergens v. sublinearis	Pi.dvs	Cleve
	divergentissima	Pi.dit	(Grunow) Cleve

Genus	Species	Code	Taxonomic authority
	divergentissima v. divergentissima	Pi.dvd	(Grunow) Cleve
	joculata	Pi.jo	(Minguin) Krammer
	mayeri	Pi.ma	Krammer
	microstauron	Pi.mi	(Ehrenberg) Cleve
	microstauron group 2	Pi.mi2	-
	cf microstauron v. brasiliensis nov. spec.	Pi.mvb	Krammer & Metzeltin
	microstauron v. rostrata nov. var.	Pi.mvr	Krammer
	rupestris	Pi.ru	Krammer
	cf schoenfelderii	Pi.sc	Krammer
	cf schumaniana	Pi.sch	(Grunow) Cleve
	similiformis	Pi.si	Krammer
	stomatophora	Pi.st	(Grunow) Cleve
	subcapitata	Pi.su	Gregory
	subgibba v. subgibba	Pi.sub	Krammer
	cf subrupestris	Pi.subr	Krammer
	cf sudetica	Pi.su	(Hilse) Peragallo
	tumuscens nov. spec.	Pi.tu	Metzeltin & Krammer
	viridiformis	Pi.vi	Krammer
	spec 40	Pi.sp40	-
	spec 41	Pi.sp41	-
	spec 42	Pi.sp42	-
Placoneis	pseudanglica	Pl.ps	(Lange-Bertalot) Cox
Planothidium	frequentissimum	Pla.fr	(Lange-Bertalot) Round & Bukhtiyarova
	rostratum	Pla.ro	(Ostrup) Round & Bukhtiyarova
Rhopalodia	brebissonii	Rh.br	Krammer
	gibba	Rh.gi	(Ehrenberg) O. Muller
Sellophora	cf gibbula nov. spec.	Se.gi	Lange-Bertalot
	pupula v. pupula	Se.pvp	Kützing
	pupula v. rectangularis	Se.pvr	(Gregory) Grunow
	rectangularis nov. comb.	Se.re	(Gregory) Lange-Bertalot
Stauroneis	cf fonticola	St.fo	Hustedt
	cf obtusa	St.ob	Lagerstedt
Staurosira	anceps	St.an	Ehrenberg
	anceps f. gracilis	St.ang	Rabenhorst
	elliptica	St.el	(Schumann) Williams & Round
	phoenicenteron f. gracilis	St.ph	(Ehrenberg) Hustedt
Stenopterobia	curvula	Ste.cu	(W. Smith) Krammer
	densestriata	Ste.de	(Hustedt) Krammer
	cf planctonica nov. spec.	Ste.pl	Lange-Bertalot
Suriella	linearis	Su.li	W. Smith
	linearis v. helvetica	Su.lvh	(Grunow) Meister
	roba	Su.ro	Leclercq
	robusta	Su.rob	Ehrenberg
	splendida	Su.sp	(Ehrenberg) Kützing
	tenera	Su.te	Gregory
Synedra	ulna	Sy.ul	Ehrenberg
Tryblionella	cf calida	Tr.ca	Grunow
	levidensis v. maxima	Tr.le	Grunow

Appendix 5: Bioavailable and total metal concentrations at each site

Site	Cu mg/L		Mn mg/L		Zn mg/L		Al mg/L		Cd mg/L		Co mg/L	
	Total	Bio	Total	Bio	Total	Bio	Total	Bio	Total	Bio	Total	Bio
RJ11	5.990	3.508	9.680	5.988	8.050	3.861	18.600	5.835	0.028	0.013	3.026	3.026
RJ12	11.500	7.411	19.700	13.471	13.800	8.114	21.300	8.089	0.029	0.016	7.319	7.319
RJ13	1.220	0.963	2.980	2.428	2.510	1.959	2.170	1.123	0.005	0.004	1.274	1.274
RJ14	1.430	1.112	3.190	2.568	2.700	2.073	2.690	1.482	0.005	0.004	1.359	1.359
RJ15	1.910	1.076	3.770	2.882	3.170	2.242	2.330	0.000	0.006	0.004	1.454	1.454
RJ16	0.601	0.381	1.560	1.304	1.120	0.892	0.040	0.002	0.002	0.002	5.906	5.906
RJ17	0.045	0.012	0.785	0.352	0.320	0.187	0.005	0.000	0.002	0.002	0.204	0.076
RJ18	0.053	0.014	0.415	0.658	0.230	0.257	0.005	0.000	0.002	0.002	0.076	0.204
RJ19	0.022	0.003	0.200	0.173	0.070	0.058	0.005	0.000	0.002	0.002	0.032	0.032
RJ110	0.003	0.000	0.033	0.032	0.080	0.075	0.005	0.000	0.001	0.001	0.004	0.004
RJC1	0.011	0.001	0.038	0.036	0.050	0.046	0.005	0.000	0.001	0.000	0.001	0.001
RJC2	0.013	0.000	0.051	0.045	0.030	0.025	0.005	0.000	0.001	0.000	0.011	0.011
RJC3	0.002	0.000	0.028	0.028	0.005	0.005	0.005	0.000	0.001	0.000	0.016	0.016
RJC4	0.018	0.001	0.023	0.020	0.090	0.075	0.060	0.000	0.004	0.004	0.003	0.003
RJC5	0.003	0.000	0.007	0.004	0.005	0.003	0.005	0.000	0.001	0.000	0.001	0.001
TGI1	0.005	0.004	0.229	0.228	0.010	0.010	0.005	0.001	0.002	0.002	0.002	0.001
TGI2	0.009	0.006	0.746	0.602	0.080	0.061	0.210	0.012	0.003	0.002	0.006	0.005
TGI3	0.011	0.009	1.000	0.899	0.330	0.290	0.100	0.030	0.006	0.005	0.025	0.022
TGI4	0.005	0.000	0.174	0.162	0.030	0.027	0.030	0.000	0.001	0.000	0.002	0.001
TGI5	0.002	0.002	0.513	0.484	0.040	0.037	0.005	0.004	0.001	0.000	0.007	0.007
TGI6	0.111	0.089	2.920	2.542	0.600	0.506	0.940	0.006	0.016	0.013	0.067	0.057
TGC1	0.007	0.001	0.017	0.017	0.005	0.005	0.005	0.000	0.001	0.000	0.004	0.004
TGC2	0.014	0.000	0.091	0.089	0.130	0.122	0.070	0.000	0.001	0.001	0.002	0.001
HCUSEC	97.800	69.781	7.510	5.593	0.619	0.427	20.900	9.006	-	-	3.620	2.609
ECDSHC	14.600	12.130	1.170	0.996	0.092	0.076	1.390	0.865	-	-	0.561	0.469
ECUS12MC	14.900	12.214	0.906	0.763	0.100	0.081	0.792	0.492	-	-	0.529	0.437
12MCDSEC	1.410	1.349	0.145	0.140	0.014	0.014	0.023	0.021	-	-	0.076	0.073
12MCUSSC	0.231	0.000	0.255	0.043	0.002	0.000	0.014	0.000	-	-	0.015	0.009
SCDS12MC	0.109	0.000	0.111	0.022	0.001	0.000	0.008	0.000	-	-	0.007	0.003
SC@BRX	0.046	0.002	0.292	0.218	0.001	0.001	0.008	0.000	-	-	0.004	0.003
12MCUSEC	0.041	0.026	0.008	0.008	0.002	0.002	0.017	0.000	-	-	0.001	0.001
ECUSBRX	0.281	0.272	0.018	0.018	0.002	0.002	0.153	0.034	-	-	0.008	0.008
SCDSCC	0.106	0.000	0.013	0.004	0.001	0.000	0.008	0.000	-	-	0.000	0.000
SCUS12MC	0.001	0.000	0.001	0.001	0.001	0.001	0.002	0.000	-	-	0.000	0.000
CHI1	3.637	12.200	262.000	87.464	7.240	0.578	847.000	50.221	0.089	0.007	15.000	4.559
CHI2	0.122	0.157	5.860	4.713	0.110	0.084	7.100	3.655	0.001	0.001	0.249	0.195
BKI1	0.029	0.231	3.120	1.966	0.140	0.075	0.690	0.002	0.001	0.000	0.251	0.149
BKI2	0.000	0.003	0.106	0.102	0.140	0.132	0.120	0.001	0.001	0.000	0.004	0.004
CHI3	0.008	0.016	15.800	8.246	0.310	0.100	3.410	0.728	0.001	0.000	0.280	0.138
CHI4	0.001	0.002	1.610	1.157	0.005	0.003	0.005	0.002	0.001	0.000	0.008	0.005
CHI5	0.212	0.336	3.380	2.722	0.160	0.122	1.590	0.004	0.001	0.001	0.328	0.254
CHI6	0.009	0.010	0.134	0.129	0.090	0.086	0.010	0.003	0.001	0.000	0.008	0.008
CHI7	0.000	0.004	0.360	0.309	0.020	0.016	0.005	0.000	0.001	0.000	0.002	0.001
CHI8	0.000	0.005	0.451	0.377	0.010	0.008	0.005	0.000	0.001	0.001	0.004	0.003
CHC1	0.000	0.002	0.012	0.012	0.030	0.028	0.090	0.000	0.001	0.000	0.005	0.005
CHC2	0.000	0.000	0.003	0.003	0.005	0.004	0.005	0.000	0.001	0.000	0.003	0.003
CHC3	0.000	0.002	0.010	0.010	0.010	0.010	0.230	0.000	0.002	0.002	0.006	0.006
CHC4	0.000	0.004	0.050	0.045	0.040	0.034	0.005	0.000	0.003	0.003	0.002	0.001

Appendix 6: Relative abundance of species occurring more than once

	RJ1	RJ2	RJ3	RJ4	RJ5	RJ6	RJ7	RJ8	RJ9	RJ10	RJC1	RJC2	RJC3	RJC4	RJC5
Ac.evg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.83	0.00	0.00	0.00	0.17	4.67
Ac.ex	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ac.mve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.00	2.33	35.33	0.00
Ac.mvm	8.33	8.50	93.17	3.17	0.00	2.83	67.00	85.33	14.50	17.33	12.33	66.50	14.33	23.83	1.83
Ac.mvs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Am.li	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.17	0.83
Au.gr	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.67	0.33	0.00	0.00
Br.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Br.ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.neo	2.00	1.67	0.00	2.17	0.17	0.17	0.00	0.00	0.00	1.17	2.17	0.00	0.33	0.33	0.00
Br.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.sp1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Ca.ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca.sp4	1.33	0.67	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca.sp5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ch.me	3.00	0.33	0.00	1.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Co.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	15.17
Cr.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.ha	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.hal	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.00	0.00
Cyc.me	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Cy.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.00
Cy.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.hu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Di.co	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83
Di.con	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.17
Dip.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
En.nr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.mi	4.00	5.17	0.00	5.50	0.00	0.00	0.00	0.17	0.00	1.00	4.33	0.00	1.00	0.33	0.00
En.ne	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.67	0.17	0.00
En.ri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00
En.si	2.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.33	0.00	0.00	0.00	2.00
En.sil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.sp6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny.fl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00
Eny.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny.sub	0.00	0.50	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Ep.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00
Eu.as	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.bi	0.33	1.50	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.17	0.83	0.00	0.50	0.00	0.00
Eu.cvc	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.cvd	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.cvdi	0.33	0.17	0.00	0.17	0.00	0.00	0.00	0.17	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Eu.fa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Eu.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.33	0.17	0.00
Eu.gr	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17	0.00	0.00
Eu.na	1.67	6.33	0.00	2.67	0.00	0.00	0.00	0.00	0.00	1.50	1.00	0.00	0.17	0.00	0.00

	TGI1	TGI2	TGI3	TGI4	TGI5	TGI6	TGC1	TGC2	HCUS EC	ECDS HC	ECUS 12MC	12MC DSEC	12MC USSC	SCDS 12MC
Ac.evg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.25	0.00	0.75	1.00
Ac.ex	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.00	0.00	0.00
Ac.mve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ac.mvm	48.75	8.25	12.25	0.00	1.50	55.25	43.25	78.75	1.75	11.02	19.25	0.50	7.75	0.00
Ac.mvs	4.75	6.25	1.50	0.00	0.00	0.00	19.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Am.li	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Au.gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.25	0.00
Br.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00
Br.ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.neo	2.75	13.75	11.00	0.00	3.75	5.25	2.25	0.25	15.00	0.00	0.25	0.00	0.00	0.00
Br.st	0.25	2.00	1.00	0.00	0.50	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.sp1	0.25	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca.ba	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
Ca.sp4	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca.sp5	0.50	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ch.me	0.50	0.25	0.50	0.00	0.75	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Co.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
Cr.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Cr.ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.hal	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.25	0.00	0.00	0.00
Cyc.me	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Cy.st	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.25	0.00	0.00	0.00
Cy.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.75	0.00	0.00	0.00
Cy.hu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	3.75	0.50
Di.co	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Di.con	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dip.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.00	3.00
En.nr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
En.mi	0.00	4.00	6.00	0.00	5.50	0.00	8.50	0.00	1.25	3.39	3.50	3.50	1.75	0.00
En.ne	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.ri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.si	1.50	0.00	1.25	0.00	0.00	1.75	7.25	0.00	0.00	5.93	10.00	0.25	0.00	0.25
En.sil	0.00	0.50	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.sp6	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00
Eny.fl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	2.25	1.25	0.00	0.00
Eny.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Eny.sub	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00
Ep.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	2.00	0.00
Eu.as	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Eu.bi	0.00	0.00	0.00	0.25	0.00	2.00	0.00	0.25	8.25	0.00	0.50	2.25	0.00	0.00
Eu.cvc	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	8.75	0.00	0.00	0.50	0.50	0.00
Eu.cvd	0.00	0.50	0.25	0.00	0.00	0.00	0.00	0.00	2.75	1.69	0.00	0.50	0.50	0.00
Eu.cvdi	0.00	0.75	0.75	0.00	0.50	0.00	0.00	0.00	3.25	0.85	0.50	0.25	0.00	0.00
Eu.fa	1.25	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Eu.na	0.25	3.00	2.00	0.00	0.00	0.00	0.25	0.00	5.50	12.71	0.00	0.25	0.00	0.00

	SC@	12MC	ECUS	CCUS	SCUS	SCDS	SCUS							
	BRX	USEC	BRX	SC	CC	CC	12MC	CHI1	CHI2	CHI3	CHI4	CHI5	CHI6	CHI7
Ac. evg	0.00	0.00	0.00	5.00	0.75	4.00	3.50	0.00	0.00	0.25	0.00	0.00	0.00	0.00
Ac. ex	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
Ac. mve	0.00	0.00	0.00	0.00	2.25	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ac. mvm	0.00	1.25	0.00	0.00	19.50	11.00	5.25	0.00	2.00	0.00	0.00	13.47	17.50	5.25
Ac. mvs	0.00	0.00	0.00	0.00	0.00	0.00	9.50	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Am. li	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Au. gr	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br. br	0.00	0.00	13.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br. ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Br. neo	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	3.75	1.75	0.00	14.71	5.25	45.75
Br. st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br. sp1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.00	0.00	0.00	8.00
Ca. ba	0.00	0.00	0.00	1.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca. sp4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.25	0.00	0.00	7.50	0.00
Ca. sp5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00
Ch. me	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00
Co. pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr. ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr. am	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.75
Cr. ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr. hal	0.00	0.75	0.00	0.25	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.50	0.00
Cyc. me	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Cy. st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Cy. ci	0.00	0.00	0.00	0.00	1.50	2.50	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy. fo	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy. hu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	1.00	0.25	0.00
Di. co	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Di. con	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dip. ps	0.00	0.00	0.00	0.00	2.75	2.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En. nr	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En. mi	0.00	10.50	24.00	0.00	0.00	0.00	0.00	0.00	0.00	4.25	0.00	1.00	0.00	3.25
En. ne	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En. ri	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En. si	0.00	16.75	22.50	0.50	1.00	2.00	0.25	0.00	0.00	0.00	0.00	0.25	4.50	0.00
En. sil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En. sp6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.50	0.00	0.00	0.00	0.00	0.00
Eny. fl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny. pe	0.00	0.00	0.00	5.00	2.00	3.50	0.75	0.00	0.00	0.00	0.00	7.48	0.75	0.00
Eny. su	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny. sub	0.00	0.25	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
Ep. ci	0.00	0.00	0.00	59.75	27.50	25.50	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. as	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. bi	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	5.50	0.00	0.00	0.00	0.50	0.00
Eu. cvc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. cvd	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Eu. cvdi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. fa	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00
Eu. fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu. na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00

	CH18	BK12	BK11	CHC1	CHC2	CHC3	CHC4
Ac.evg	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Ac.ex	0.00	0.00	0.00	0.00	4.25	0.00	0.00
Ac.mve	0.00	2.25	0.00	0.00	0.00	0.00	0.00
Ac.mvm	1.00	3.00	0.00	1.50	71.00	0.00	0.00
Ac.mvs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Am.li	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Au.gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.ma	0.00	0.00	0.00	0.25	0.00	0.25	0.00
Br.neo	39.00	3.25	0.00	4.50	0.50	13.75	2.00
Br.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Br.sp1	2.00	0.00	0.00	0.00	0.00	6.00	0.25
Ca.ba	0.00	0.00	2.00	0.00	0.50	0.00	0.00
Ca.sp4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca.sp5	0.50	0.00	0.00	0.00	2.00	0.00	0.75
Ch.me	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Co.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.ac	0.00	0.00	0.00	0.00	0.00	0.25	0.50
Cr.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr.ha	0.00	0.00	0.00	0.00	0.00	1.00	0.75
Cr.hal	2.25	0.00	0.00	0.25	0.25	1.00	7.00
Cyc.me	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.ci	0.00	0.75	0.00	0.25	0.00	0.00	0.00
Cy.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cy.hu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Di.co	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Di.con	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dip.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.nr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.mi	1.50	0.00	0.00	10.00	0.50	9.25	7.75
En.ne	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.ri	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.si	0.00	0.50	0.00	0.00	0.00	0.00	0.00
En.sil	0.00	0.00	0.00	0.00	0.00	0.00	0.00
En.sp6	0.00	0.00	0.00	7.25	0.25	0.50	2.00
Eny.fl	0.00	0.00	0.00	25.25	0.00	3.75	0.75
Eny.pe	0.00	0.50	0.00	0.50	0.00	0.00	0.00
Eny.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eny.sub	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ep.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.as	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.bi	0.00	0.25	0.00	0.00	1.00	0.00	0.25
Eu.cvc	0.00	0.00	0.00	1.25	0.00	0.25	0.00
Eu.cvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.cvdi	0.00	0.00	0.00	0.75	0.00	0.25	0.00
Eu.fa	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.fo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.gr	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Eu.lo	0.00	0.00	0.00	0.25	0.00	0.00	0.50
Eu.mo	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Eu.na	0.00	0.00	0.00	0.00	0.00	1.75	0.25

	RJI1	RJI2	RJI3	RJI4	RJI5	RJI6	RJI7	RJI8	RJI9	RJI10	RJC1	RJC2	RJC3	RJC4	RJC5
Eu.pvu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17	0.00
Eu.ra	0.33	1.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.rva	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ser	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
Eu.tr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.tri	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00
Eu.ve	0.00	0.33	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17
Eu.sp9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.17	0.00	0.00	0.00	0.00
Eu.sp10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
Eu.sp12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.sp14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fa.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Fr.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.ca	1.67	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.50	3.17	0.00	3.33	5.83	0.50
Fr.te	2.00	3.17	0.00	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Fru.rh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.00	0.00
Go.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00
Go.ex	0.00	1.33	0.00	0.67	0.00	0.00	0.33	0.00	0.00	5.50	1.50	0.00	0.00	0.33	0.00
Go.ex2	9.33	6.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	0.00	0.00	0.00
Go.gr	1.00	0.00	0.00	1.33	0.00	0.17	0.00	0.00	0.00	3.50	3.17	0.00	0.33	0.33	0.00
Go.gr2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.la	1.33	1.50	0.00	1.50	0.00	0.00	0.17	0.00	0.00	5.00	0.50	0.00	1.67	2.50	4.50
Go.pa	0.00	0.00	0.00	3.17	0.00	0.00	0.00	0.00	0.00	0.67	3.50	0.00	0.00	0.17	0.00
Go.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.vi	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Go.sp15	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00
Go.sp16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.sp19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.33	0.00
Gy.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Ha.am	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ha.avv	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ko.sp	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.67	0.00
Lu.ge	0.33	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00
Lu.mu	0.33	1.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.17	0.00	0.00	2.00	0.67	0.00
Lu.sp	0.00	0.17	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May.eo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.83	1.00	0.50	1.00
Ma.avp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.83	0.00	0.00
Na.an	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.50
Na.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	0.00
Na.ge	0.00	0.83	0.00	1.00	0.00	0.00	0.33	0.00	1.67	0.00	0.17	0.00	0.33	0.00	0.50
Na.ge2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.gl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Na.he	1.00	1.33	0.00	1.00	0.33	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.17	0.00	0.00
Na.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Na.no	1.67	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	2.67	18.83	0.00	7.83	2.67	9.50
Na.ra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	0.00	1.50	0.50	0.00
Na.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TGI1	TGI2	TGI3	TGI4	TGI5	TGI6	TGC1	TGC2	HCUS EC	ECDS HC	ECUS 12MC	12MC DSEC	12MC USSC	SCDS 12MC
Eu.pvu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ra	1.25	2.00	0.50	0.00	0.75	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.rva	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.75	0.75	0.00
Eu.ser	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Eu.si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.tr	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Eu.tri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ve	0.00	0.00	0.00	0.00	0.25	2.00	0.25	0.50	0.75	0.00	0.25	0.75	0.00	0.00
Eu.sp9	0.25	0.00	0.50	0.25	0.00	0.00	0.50	0.00	0.25	1.69	0.00	0.75	0.00	0.00
Eu.sp10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.sp12	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.85	0.00	0.00	0.00	0.00
Eu.sp14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	1.00	0.50	0.00
Fa.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00
Fr.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Fr.te	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.50	0.00	0.00	0.50	0.00	0.00
Fru.rh	0.25	0.00	0.00	0.00	0.00	0.50	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Go.af	1.75	3.75	0.00	0.00	0.00	4.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.cl	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.ex	6.00	0.00	0.00	0.50	0.00	1.25	3.00	0.25	0.00	2.54	0.00	0.50	0.00	0.00
Go.ex2	0.00	6.00	7.25	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Go.gr	0.50	15.50	12.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	1.50	0.00	0.00
Go.gr2	0.00	0.25	2.75	0.00	5.50	2.75	0.00	0.00	0.00	6.78	0.25	1.75	0.00	0.00
Go.la	0.50	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00	0.25
Go.pa	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.pu	0.00	0.00	1.75	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.50	3.00	0.00	0.00
Go.vi	1.25	1.50	0.00	0.00	0.25	0.00	2.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Go.sp15	0.00	0.00	2.00	0.00	2.50	0.50	0.00	6.25	0.00	0.00	0.00	3.75	0.00	0.00
Go.sp16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.sp19	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gy.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ha.am	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	1.50	1.69	0.25	0.00	0.00	0.00
Ha.avv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ko.sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Lu.ge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lu.mu	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	1.25	1.00	0.50	0.00
Lu.sp	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May.eo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00
Ma.avp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00
Na.cr	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.25
Na.ge	0.00	0.50	0.75	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.25	0.25
Na.ge2	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.gl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75
Na.he	0.25	4.25	16.50	0.00	2.00	1.50	2.25	1.00	0.00	0.00	0.25	5.50	0.00	0.00
Na.le	5.75	4.75	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.lo	0.00	0.00	1.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	2.25
Na.no	0.25	1.50	1.50	0.00	2.25	5.25	0.00	3.00	0.50	11.86	0.25	14.25	0.50	0.00
Na.ra	0.00	0.50	0.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	1.25	0.25	0.00	0.00
Na.ro	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50

	SC@	12MC	ECUS	CCUS	SCUS	SCDS	SCUS							
	BRX	USEC	BRX	SC	CC	CC	12MC	CHI1	CHI2	CHI3	CHI4	CHI5	CHI6	CHI7
Eu.pvu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Eu.rva	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ser	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Eu.tr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.50	0.00	0.00
Eu.tri	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ve	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	0.00
Eu.sp9	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.sp10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.sp12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Eu.sp14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fa.te	0.25	0.00	0.00	0.00	3.25	2.00	6.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.te	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fru.rh	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Go.ex	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.ex2	0.00	9.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.gr	0.00	5.25	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Go.gr2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.la	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.pa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.pu	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.vi	0.00	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.sp15	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.00
Go.sp16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Go.sp19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gy.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
Ha.am	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Ha.avv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ko.sp	50.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Lu.ge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lu.mu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.50	0.25	0.25	0.00	0.00
Lu.sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May.eo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ma.avp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ci	0.50	0.00	0.00	0.00	0.25	0.00	0.75	0.00	0.00	0.25	0.00	0.00	1.25	0.00
Na.cr	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.25	0.00	0.00	0.00	1.25	0.00
Na.ge	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	1.00	0.00	0.00	0.50	0.50	0.00
Na.ge2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
Na.gl	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.he	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Na.lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.na	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.25	0.25	0.00
Na.no	0.00	10.00	7.50	0.75	3.25	3.50	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
Na.ra	0.00	0.50	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ro	0.00	0.00	0.00	0.00	0.50	1.00	0.75	0.00	0.00	0.00	0.00	0.25	0.00	0.00

	CH18	BK12	BK11	CHC1	CHC2	CHC3	CHC4
Eu.pvu	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Eu.ra	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Eu.rva	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ser	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.si	0.00	0.00	0.00	0.25	0.50	0.00	0.00
Eu.tr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.tri	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.ve	0.00	0.00	0.00	0.75	0.00	0.00	0.00
Eu.sp9	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Eu.sp10	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Eu.sp12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eu.sp14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fa.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fr.br	0.00	0.25	1.00	0.00	0.00	0.00	0.00
Fr.ca	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Fr.te	0.00	0.00	0.00	0.50	1.25	0.00	0.00
Fru.rh	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.cl	0.00	0.00	0.00	0.00	0.00	0.75	0.00
Go.ex	0.00	0.00	0.00	3.00	0.00	0.00	1.75
Go.ex2	0.00	0.00	0.00	4.25	0.00	0.00	0.50
Go.gr	0.50	0.00	0.00	4.75	0.00	13.25	0.00
Go.gr2	0.00	0.00	0.00	0.00	0.00	0.00	14.00
Go.la	0.50	0.00	0.00	1.25	0.00	0.00	0.00
Go.pa	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.vi	0.00	0.00	0.00	1.00	0.00	0.50	4.25
Go.sp15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Go.sp16	0.00	0.00	2.00	0.00	0.00	0.00	0.00
Go.sp19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gy.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ha.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ha.avv	0.00	0.00	0.00	0.00	0.00	0.00	0.25
Ko.sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lu.ge	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lu.mu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lu.sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May.eo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ma.avp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ci	0.00	0.00	0.00	0.00	0.00	0.00	0.75
Na.cr	0.00	0.00	0.00	0.00	0.25	0.00	0.50
Na.ge	0.00	0.00	0.00	0.50	0.00	6.75	0.00
Na.ge2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.gl	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.he	1.50	0.00	0.00	11.75	0.00	2.50	2.00
Na.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.no	0.75	0.00	0.00	11.50	0.00	9.00	4.75
Na.ra	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	RJI1	RJI2	RJI3	RJI4	RJI5	RJI6	RJI7	RJI8	RJI9	RJI10	RJC1	RJC2	RJC3	RJC4	RJC5
Na.sc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	7.50	0.33	0.83
Na.sch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	0.17
Na.se	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.50	0.00	0.00	0.00
Na.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.33	0.00	0.00	0.17	0.00
Na.va	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.33	0.00	0.00
Na.ve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Na.vi	0.67	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.17	0.00	0.00
Na.sp20	0.00	1.67	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp22	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.17
Na.sp30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	1.50	0.33	0.00
Na.sp31	3.33	2.50	4.17	4.83	1.33	0.00	9.83	3.00	66.17	0.17	0.33	4.17	0.00	0.33	3.00
Na.sp32	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Nad.di	0.00	0.00	0.00	1.17	0.00	0.00	0.00	0.00	0.00	1.33	1.17	0.67	1.17	0.00	0.00
Nad.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Nad.su	0.33	1.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.tr	0.00	0.17	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	3.17	0.00	0.00	0.00	0.00
Ne.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00
Ne.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Ne.amp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ne.sp33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Np.sp34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
Ni.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	0.00	2.17	1.33	1.33
Ni.an	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ar	0.00	3.33	0.00	9.83	0.33	0.00	0.00	0.00	0.00	3.67	1.33	0.00	0.00	0.00	0.50
Ni.gr	9.33	0.83	0.00	3.50	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00
Ni.ha	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	3.67	0.00	0.00	0.00	0.00
Ni.in	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	4.17	0.17	0.00	0.00
Ni.lie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.33	0.50	0.00
Ni.lin	0.00	0.00	0.67	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.33
Ni.mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00
Ni.na	0.67	1.50	0.00	1.17	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	1.00	0.50	0.00
Ni.pvp	3.00	2.17	1.17	5.17	1.00	0.00	19.50	8.50	15.50	6.00	8.33	13.00	5.67	1.00	2.17
Ni.pvt	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.pa	6.67	11.17	0.00	14.17	0.33	76.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.17	0.17	0.00	0.00
Ni.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	15.00	1.17	0.17
Ni.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	0.17	0.00	0.00
Ni.va	5.33	13.67	0.00	4.17	0.00	20.50	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp35	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
Ni.sp36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.33	0.00	0.83	1.50	5.50
Pi.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.17
Pi.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.di	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.div	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00

	TGI1	TGI2	TGI3	TGI4	TGI5	TGI6	TGC1	TGC2	HCUS EC	ECDS HC	ECUS 12MC	12MC DSEC	12MC USSC	SCDS 12MC
Na.sc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.se	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Na.te	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.va	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.vi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.00	0.00
Na.sp20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp22	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Na.sp27	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp31	0.00	0.00	0.50	0.50	0.00	0.25	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00
Na.sp32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00
Nad.di	0.25	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.25	2.50	0.00	0.00
Nad.st	0.00	0.00	0.00	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	2.54	0.00	1.25	0.00	0.00
Nad.tr	2.50	0.00	0.25	0.25	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Ne.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Ne.am	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Ne.amp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ne.sp33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Np.sp34	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	3.39	0.00	0.00	0.00	0.00
Ni.ag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.am	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	1.25	0.00	0.00	0.00
Ni.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
Ni.ar	0.00	0.00	1.50	0.00	3.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	15.75
Ni.gr	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	13.56	1.00	3.50	0.00	0.00
Ni.ha	0.00	0.50	2.00	0.00	0.00	0.00	0.50	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.in	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	2.00
Ni.lie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.50	4.50
Ni.lin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.na	0.00	0.25	0.75	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.pvp	0.75	0.75	0.00	6.00	0.50	2.00	0.00	0.00	0.00	0.85	5.50	1.00	23.25	0.00
Ni.pvt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	37.25	44.75
Ni.pa	0.00	0.00	0.00	48.25	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00
Ni.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Ni.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Ni.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.va	0.00	0.50	0.00	1.25	0.00	0.00	0.00	0.00	27.75	3.39	0.00	1.50	0.00	0.00
Ni.sp35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp36	0.00	1.50	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp39	0.00	0.00	0.00	0.00	0.00	5.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	6.50
Pi.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.br	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Pi.di	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.div	0.00	0.00	0.00	0.00	1.75	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00

	SC@	12MC	ECUS	CCUS	SCUS	SCDS	SCUS							
	BRX	USEC	BRX	SC	CC	CC	12MC	CHI1	CHI2	CHI3	CHI4	CHI5	CHI6	CHI7
Na.sc	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sch	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Na.se	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.25
Na.va	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ve	0.00	0.00	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.vi	0.00	1.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp21	0.25	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp26	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Na.sp29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp31	0.00	4.25	0.00	6.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp32	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.di	0.00	0.75	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.su	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.25
Nad.tr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Ne.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00
Ne.am	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
Ne.amp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ne.sp33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Np.sp34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50
Ni.ag	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.am	0.00	0.00	0.00	0.50	0.00	0.00	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ar	0.00	0.00	0.00	1.75	0.00	2.50	0.00	0.00	3.75	0.00	0.00	1.00	0.00	0.00
Ni.gr	0.00	0.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00
Ni.ha	0.00	0.00	0.00	0.50	0.75	0.00	0.00	0.00	0.50	0.00	0.00	2.00	11.75	1.00
Ni.in	0.00	0.00	0.00	0.25	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.lie	0.00	0.00	0.00	4.75	10.00	16.50	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00
Ni.lin	0.00	0.00	0.00	0.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.mi	0.00	0.00	0.00	0.00	0.75	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	2.25	0.75	3.24	0.00	3.50
Ni.pvp	0.00	1.00	0.00	0.00	2.50	1.50	0.00	0.00	0.00	2.25	65.00	2.49	3.25	23.00
Ni.pvt	48.50	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	33.00	0.00	0.00	0.00
Ni.pa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.25	16.00	0.50	27.43	0.00	2.00
Ni.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Ni.ps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.25	0.00	0.00	1.50	1.00
Ni.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ro	0.00	0.00	0.00	1.25	1.25	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.su	0.00	0.00	0.00	0.50	0.25	1.50	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00
Ni.va	0.00	0.00	0.50	0.00	0.00	0.00	0.00	99.75	16.00	3.50	0.00	5.99	0.00	0.00
Ni.sp35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Ni.sp39	0.00	0.00	0.00	0.00	1.75	0.00	0.75	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Pi.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.di	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Pi.div	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	1.00	0.00

	CH18	BK12	BK11	CHC1	CHC2	CHC3	CHC4
Na.sc	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sch	0.00	0.00	0.00	0.00	0.00	0.00	0.75
Na.se	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.va	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.ve	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.vi	0.00	0.00	5.00	0.00	0.00	0.00	0.00
Na.sp20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp22	0.00	0.00	0.00	0.00	0.00	4.75	0.00
Na.sp26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp27	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na.sp32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.di	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nad.su	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Nad.tr	0.25	0.00	0.00	0.00	0.00	2.25	0.00
Ne.af	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ne.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ne.amp	0.00	0.00	0.00	0.25	0.00	0.75	0.50
Ne.sp33	0.00	0.00	0.00	0.00	0.25	0.00	0.75
Np.sp34	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Ni.ag	0.00	0.00	0.00	0.00	0.00	0.00	0.25
Ni.am	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ar	15.00	0.00	4.00	0.00	1.50	7.25	9.25
Ni.gr	0.00	0.00	0.00	0.00	0.00	2.25	0.00
Ni.ha	15.25	0.00	0.00	0.00	6.25	0.00	14.00
Ni.in	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.lie	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.lin	0.00	0.00	0.00	0.00	3.00	0.00	0.00
Ni.mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.na	0.50	37.75	4.00	0.00	0.00	0.00	0.00
Ni.pvp	7.75	0.50	8.00	0.25	1.25	3.00	6.50
Ni.pvt	2.00	0.00	0.00	0.00	2.50	2.50	0.75
Ni.pa	0.75	43.50	72.00	0.00	0.00	0.00	0.00
Ni.pe	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ps	1.75	0.00	0.00	0.00	0.25	0.25	3.00
Ni.pu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.su	0.00	0.00	0.00	0.00	0.25	0.25	0.00
Ni.va	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni.sp39	0.00	0.00	0.00	0.00	0.25	0.00	2.00
Pi.ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.di	0.25	0.00	0.00	0.00	0.00	0.25	0.00
Pi.div	0.25	0.00	0.00	0.25	0.00	0.00	0.00

	RJ11	RJ12	RJ13	RJ14	RJ15	RJ16	RJ17	RJ18	RJ19	RJ110	RJC1	RJC2	RJC3	RJC4	RJC5
Pi.dvs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dit	0.00	0.00	0.00	5.83	1.17	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.jo	0.00	0.00	0.00	0.00	94.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.ma	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Pi.mi	0.00	0.17	0.00	0.00	0.00	0.00	0.00	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mi2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mvb	0.00	0.83	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00
Pi.mvr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67	0.00	0.00	0.00
Pi.ru	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sc	10.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.su	5.67	5.17	0.00	7.00	0.00	0.00	1.83	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00
Pi.sud	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.tu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.vi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pla.fr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00
Pla.ro	2.67	0.17	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.33	0.00	0.00	6.50	0.17	0.50
Rh.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00
Rh.gi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.00
Se.pvp	0.00	0.00	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.67	4.33	0.17	1.67	0.67	3.33
Se.pvr	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se.re	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.ob	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.an	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
St.ph	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.17
Ste.cu	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.17	0.00	0.00
Ste.de	0.00	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ste.pl	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Su.lvh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Su.ro	1.00	0.00	0.00	0.17	0.17	0.00	0.17	0.33	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Su.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	1.17
Sy.ul	1.33	2.17	0.00	1.83	0.00	0.00	0.00	0.00	0.00	5.50	5.67	0.17	2.17	3.67	1.50
Tr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Tr.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00

	TGI1	TGI2	TGI3	TGI4	TGI5	TGI6	TGC1	TGC2	HCUS EC	ECDS HC	ECUS 12MC	12MC DSEC	12MC USSC	SCDS 12MC
Pi.dvs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Pi.dit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00
Pi.jo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	10.75	0.00
Pi.ma	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00
Pi.mi	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Pi.mi2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Pi.mvb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mvr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00
Pi.ru	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Pi.sc	0.00	0.00	0.50	0.25	0.25	0.50	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00
Pi.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
Pi.su	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	6.25	5.93	0.75	4.75	0.00	0.00
Pi.sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.tu	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Pi.vi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp41	0.00	0.25	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.50	0.00	0.00	0.00
Pla.fr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Pla.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	1.25	0.00	0.25
Rh.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rh.gi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se.pvp	1.75	1.00	0.25	0.00	1.25	1.50	0.25	2.75	0.00	0.00	0.75	1.00	0.50	0.50
Se.pvr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se.re	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
St.ob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.an	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.ph	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Ste.cu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ste.de	0.00	3.75	2.75	0.00	0.50	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Ste.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Su.lvh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Su.ro	0.00	1.25	5.50	0.00	43.75	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Su.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sy.ul	1.25	1.00	1.75	0.00	0.00	1.00	0.50	0.25	0.00	0.00	0.00	8.75	0.75	1.00
Tr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75
Tr.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	SC@	12MC	ECUS	CCUS	SCUS	SCDS	SCUS							
	BRX	USEC	BRX	SC	CC	CC	12MC	CHI1	CHI2	CHI3	CHI4	CHI5	CHI6	CHI7
Pi.dvs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Pi.jo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Pi.ma	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Pi.mi	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Pi.mi2	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mvb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mvr	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.25
Pi.ru	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Pi.sc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Pi.st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00
Pi.su	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	2.00	22.75	0.00	3.24	2.25	0.00
Pi.sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.tu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	2.75	0.00	0.00	0.25	0.00
Pi.vi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00
Pi.sp41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pla.fr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pla.ro	0.00	0.00	0.00	6.00	5.75	10.00	8.75	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Rh.br	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Rh.gi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se.pvp	0.00	1.25	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.75	0.00	0.50	13.50	0.00
Se.pvr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.00
Se.re	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.ob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
St.an	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
St.ph	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Ste.cu	0.00	4.75	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00
Ste.de	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Ste.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Su.lvh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	2.75	0.00	0.00	0.00	0.00
Su.ro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	1.00
Su.te	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sy.ul	0.00	11.00	0.25	0.50	0.75	2.00	0.00	0.00	1.00	1.75	0.00	1.25	5.25	1.25
Tr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tr.le	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00

	CH18	BK12	BK11	CHC1	CHC2	CHC3	CHC4
Pi.dvs	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Pi.dit	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.dvd	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.jo	0.00	3.50	0.00	0.00	0.00	0.00	0.00
Pi.ma	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mi2	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Pi.mvb	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.mvr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.ru	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sc	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.st	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Pi.su	0.50	0.00	0.00	0.00	0.00	0.50	0.50
Pi.sud	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Pi.tu	0.00	0.00	0.00	0.75	0.00	0.25	0.00
Pi.vi	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Pi.sp41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pi.sp42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pla.fr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pla.ro	0.00	1.50	0.00	0.00	0.00	0.25	0.00
Rh.br	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Rh.gi	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se.pvp	0.00	0.00	0.00	0.00	0.50	0.50	4.75
Se.pvr	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Se.re	0.00	0.00	0.00	0.00	0.00	0.25	1.75
St.ob	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St.an	0.00	0.00	0.00	0.00	0.00	0.00	0.25
St.ph	0.00	0.00	0.00	0.25	0.00	0.75	0.00
Ste.cu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ste.de	0.00	0.50	0.00	5.25	0.00	1.25	0.00
Ste.pl	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Su.lvh	0.00	0.00	2.00	0.00	0.00	0.00	0.50
Su.ro	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Su.te	0.00	0.00	0.00	0.00	0.00	0.00	1.50
Sy.ul	4.75	0.00	0.00	0.00	0.75	0.00	0.50
Tr.ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tr.le	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix 7: Relative abundance of genera occurring more than once

Genus	code	RJ1	RJ2	RJ3	RJ4	RJ5	RJ6	RJ7	RJ8	RJ9	RJ10	RJC1	RJC2
Achnantheidium	Ach	8.33	8.50	93.17	3.17	0.00	2.83	67.00	85.33	14.50	25.83	13.67	66.50
Amphora	Amp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira	Aul	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.67
Brachysira	Bra	2.00	1.67	0.00	2.17	0.17	0.17	0.00	0.00	0.00	1.33	2.50	0.00
Caloneis	Cal	1.33	1.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chameapinnularia	Cha	3.00	0.33	0.00	1.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis	Coc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Craticula	Cra	0.67	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.33	0.67	0.00
Cyclotella	Cyc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Cymbella	Cym	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Diadesmis	Dia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
Diploneis	Dip	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonema	Enc	6.00	5.17	0.17	5.50	0.00	0.00	0.00	0.17	0.00	2.33	4.67	0.83
Encyonopsis	Ency	0.67	0.50	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00
Epithemia	Epi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia	Eun	3.00	11.17	0.00	4.67	0.00	0.00	0.00	0.17	0.00	3.17	3.67	0.00
Fallacia	Fal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragillaria	Fra	3.67	6.17	0.00	2.17	0.00	0.00	0.00	0.00	0.00	16.50	3.33	0.00
Frustulia	Fru	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.17	0.00
Gomphonema	Gom	11.67	10.17	0.00	10.00	0.00	0.17	0.50	0.00	0.00	16.17	9.67	0.00
Gyrosigma	Gry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hantzschiana	Han	0.00	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Koboyasia	Kob	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Luticola	Lut	0.67	1.33	0.00	0.67	0.00	0.00	0.50	0.00	0.00	0.17	0.00	0.00
Mayamea	May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.83
Navicula	Nav	8.00	7.17	4.17	10.33	1.67	0.00	10.17	3.00	67.83	6.00	26.83	6.00
Naviculadicta	Navd	0.33	1.67	0.00	2.33	0.00	0.00	0.00	0.00	0.00	1.50	4.33	0.67
Neidium	Nei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.17
Nupela	Nup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia	Nit	26.67	32.67	2.17	39.00	1.67	96.67	19.83	8.50	15.50	17.00	17.33	18.33
Pinnularia	Pin	17.33	6.67	0.33	13.17	96.00	0.00	1.83	2.33	1.50	0.17	1.17	5.00
Planothidium	Plan	2.67	0.17	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.33	0.00	0.00
Rhopalodia	Rho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
Sellophora	Sel	0.00	1.67	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.67	4.33	0.17
Stauroneis	Sta	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staurosira	Stau	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Stenopterobia	Ste	0.67	1.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
Suriella	Sur	1.00	0.00	0.00	0.17	0.17	0.00	0.17	0.33	0.00	0.00	0.33	0.00
Synedra	Syn	1.33	2.17	0.00	1.83	0.00	0.00	0.00	0.00	0.00	5.50	5.67	0.17
Tryblionella	Try	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00

Genus	code	HCUS											
		RJC3	RJC4	RJC5	TGI1	TGI2	TGI3	TGI4	TGI5	TGI6	TGC1	TGC2	EC
Achnantheidium	Ach	17.01	59.67	6.54	53.50	14.50	13.75	0.00	1.50	55.25	62.50	78.75	1.75
Amphora	Amp	0.34	0.17	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira	Aul	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
Brachysira	Bra	0.34	0.33	0.00	3.25	18.00	12.00	28.00	4.25	5.25	2.50	0.25	15.00
Caloneis	Cal	0.00	0.00	0.00	0.75	0.00	0.25	0.00	0.00	0.25	0.00	0.00	0.00
Chameapinnularia	Cha	0.00	0.00	0.00	0.50	0.25	0.50	0.00	0.75	0.00	0.00	0.00	0.50
Cocconeis	Coc	0.51	0.00	15.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Craticula	Cra	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Cyclotella	Cyc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.00
Cymbella	Cym	0.00	1.33	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diadesmis	Dia	0.00	0.00	1.01	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis	Dip	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonema	Enc	1.70	0.50	2.01	12.50	4.50	7.25	0.00	5.50	2.50	15.75	0.00	1.25
Encyonopsis	Ency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Epithemia	Epi	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia	Eun	1.53	0.67	0.34	3.75	8.00	4.00	0.50	1.75	5.50	1.25	1.25	32.00
Fallacia	Fal	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragillaria	Fra	3.40	5.83	0.50	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.50	0.50
Frustulia	Fru	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	1.00	0.25	0.00	0.00
Gomphonema	Gom	2.89	3.83	4.70	10.00	30.50	25.75	0.50	9.50	9.00	8.50	7.50	0.00
Gyrosigma	Gry	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hantzschiana	Han	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	1.50
Koboyasia	Kob	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Luticola	Lut	4.59	0.67	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.25	0.00	1.75
Mayamea	May	1.87	0.50	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula	Nav	25.34	5.67	16.11	6.25	11.50	21.25	0.50	8.00	7.50	5.75	4.00	3.25
Naviculadicta	Navd	1.19	0.00	0.00	2.75	0.00	0.25	0.25	1.25	0.25	0.50	0.00	0.50
Neidium	Nei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.25	0.00
Nupela	Nup	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00
Nitzschia	Nit	27.55	13.67	12.75	2.00	5.00	4.25	66.50	4.25	8.50	1.00	3.00	31.00
Pinnularia	Pin	0.00	0.00	0.17	0.00	0.50	0.50	2.75	3.50	0.75	0.25	0.50	10.25
Planothidium	Plan	6.63	0.17	29.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhopalodia	Rho	0.00	0.33	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sellophora	Sel	1.70	0.67	3.36	1.75	1.00	0.25	0.00	1.25	1.50	0.25	2.75	0.00
Stauroneis	Sta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staurosira	Stau	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.00
Stenopterobia	Ste	0.17	0.00	0.00	0.00	3.75	2.75	0.00	0.50	0.25	0.00	0.00	0.25
Suriella	Sur	0.34	0.00	1.85	0.00	1.25	5.50	0.00	56.75	1.25	0.00	0.25	0.00
Synedra	Syn	2.21	3.67	1.51	1.25	1.00	1.75	0.00	0.00	1.00	0.50	0.25	0.00
Tryblionella	Try	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Genus	code	ECDS	ECUS	12MC	12MC	SCDS	SC@	12MC	ECUS	CCUS	SCUS	SCDS	SCUS	CHI1
		HC	12MC	DSEC	USSC	12MC	BRX	USEC	BRX	SC	CC	CC	12MC	
Achnantheidium	Ach	11.02	29.00	0.50	8.50	1.00	0.00	1.75	0.00	5.00	22.50	22.00	18.25	0.00
Amphora	Amp	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Aulacoseira	Aul	0.00	0.00	2.75	0.25	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Brachysira	Bra	1.69	0.25	0.00	0.00	0.00	0.00	0.00	14.00	0.00	0.00	0.00	0.00	0.25
Caloneis	Cal	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	1.25	0.50	0.00	0.00	0.00
Chameapinnularia	Cha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
Cocconeis	Coc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Craticula	Cra	0.00	0.50	0.00	0.00	0.25	0.00	0.75	0.00	0.75	0.00	0.00	0.00	0.00
Cyclotella	Cyc	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella	Cym	0.00	20.25	0.00	3.75	1.00	0.00	0.00	0.00	0.00	3.25	2.50	0.25	0.00
Diadesmis	Dia	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis	Dip	0.00	0.25	0.50	0.00	3.00	0.00	0.00	0.00	0.00	2.75	2.00	3.00	0.00
Encyonema	Enc	9.32	14.25	4.00	1.75	0.25	0.00	27.50	46.50	0.50	1.50	2.00	0.25	0.00
Encyonopsis	Ency	0.85	2.25	1.25	0.50	0.00	0.00	0.25	16.00	5.75	2.00	3.50	0.75	0.00
Epithemia	Epi	0.00	1.50	0.00	2.00	0.00	0.00	0.00	0.00	60.50	27.50	25.50	40.00	0.00
Eunotia	Eun	17.80	2.00	11.75	2.25	0.00	0.00	1.50	5.50	0.00	0.00	0.00	0.00	0.00
Fallacia	Fal	0.00	0.00	0.00	0.00	6.00	0.25	0.00	0.00	0.00	3.25	2.00	6.50	0.00
Fragillaria	Fra	0.00	0.00	0.50	0.00	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.50	0.00
Frustulia	Fru	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00
Gomphonema	Gom	10.17	2.75	11.00	1.00	0.25	0.00	19.25	3.00	0.00	0.75	0.00	0.00	0.00
Gyrosigma	Gry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hantzschiana	Han	1.69	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00
Koboyasia	Kob	0.00	0.50	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Luticola	Lut	0.00	1.25	1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mayamea	May	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula	Nav	11.86	5.25	28.50	1.75	6.75	0.75	17.25	7.50	9.25	7.25	5.00	6.50	0.00
Naviculadicta	Navd	2.54	0.25	4.00	0.00	0.00	0.00	0.75	0.50	0.00	1.50	0.00	0.00	0.00
Neidium	Nei	0.00	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Nupela	Nup	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia	Nit	21.19	8.25	7.00	61.50	79.00	48.50	1.25	1.50	10.50	18.50	23.50	14.75	99.75
Pinnularia	Pin	8.47	3.75	5.25	13.75	0.00	0.50	2.00	1.75	0.00	0.00	0.00	0.00	0.00
Planothidium	Plan	0.00	4.00	1.25	0.50	0.25	0.00	0.00	0.00	6.00	5.75	10.00	8.75	0.00
Rhopalodia	Rho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sellophora	Sel	0.00	0.75	1.25	0.50	0.50	0.00	1.25	0.25	0.00	0.25	0.00	0.00	0.00
Stauroneis	Sta	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staurosira	Stau	0.00	0.00	0.25	0.00	0.00	0.00	1.25	0.25	0.00	0.00	0.00	0.25	0.00
Stenopterobia	Ste	0.00	0.00	0.00	0.00	0.00	0.00	6.25	1.75	0.00	0.00	0.00	0.00	0.00
Suriella	Sur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Synedra	Syn	0.00	0.00	8.75	0.75	1.00	0.00	11.00	0.25	0.50	0.75	2.00	0.00	0.00
Tryblionella	Try	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00

Genus	code	CHI2	CHI3	CHI4	CHI5	CHI6	CHI7	CHI8	BK1	BK12	CHC1	CHC2	CHC3	CHC4
Achnantheidium	Ach	2.00	0.25	0.00	13.47	20.00	5.25	1.00	0.00	5.75	1.50	75.25	0.00	0.00
Amphora	Amp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira	Aul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brachysira	Bra	3.75	6.25	0.00	14.71	5.50	53.75	41.00	0.00	3.25	4.75	0.50	20.00	2.25
Caloneis	Cal	0.50	1.25	0.00	0.00	14.50	0.00	0.50	2.00	0.00	0.00	2.50	0.00	0.75
Chameapinnularia	Cha	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis	Coc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Craticula	Cra	0.00	1.00	0.00	0.00	0.75	0.75	2.25	0.00	0.00	0.25	0.25	2.25	8.25
Cyclotella	Cyc	0.00	0.00	0.00	0.25	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella	Cym	0.50	0.50	0.00	1.00	0.25	0.00	0.00	0.00	0.75	0.25	0.25	0.00	0.00
Diadesmis	Dia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis	Dip	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonema	Enc	5.50	4.25	0.00	1.25	4.50	3.25	1.50	0.00	0.50	17.25	0.75	9.75	9.75
Encyonopsis	Ency	0.00	0.25	0.00	7.48	0.75	0.00	0.00	0.00	0.50	25.75	0.00	3.75	0.75
Epithemia	Epi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia	Eun	7.75	0.50	0.00	1.50	4.25	0.00	0.25	0.00	0.25	4.50	1.50	2.75	1.00
Fallacia	Fal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragillaria	Fra	0.00	0.00	0.00	0.25	0.00	0.00	0.00	1.00	0.25	0.50	1.50	0.00	0.00
Frustulia	Fru	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
Gomphonema	Gom	1.00	0.25	0.00	0.75	0.25	0.00	1.00	2.00	0.00	14.25	0.00	14.50	20.50
Gyrosigma	Gry	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hantzschiana	Han	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
Koboyasia	Kob	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Luticola	Lut	1.00	0.50	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mayamea	May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula	Nav	1.25	0.25	0.00	2.99	6.25	0.75	2.50	5.00	0.00	23.75	0.25	23.00	8.75
Naviculadicta	Navd	1.25	4.00	0.00	0.00	0.25	0.25	0.25	0.00	0.00	0.00	0.25	2.50	0.00
Neidium	Nei	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.75	1.25
Nupela	Nup	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Nitzschia	Nit	69.75	29.25	99.25	46.38	18.00	30.50	43.00	88.00	81.75	0.25	15.25	15.50	35.75
Pinnularia	Pin	2.25	28.75	0.00	5.24	4.75	2.25	1.00	0.00	3.50	1.25	0.00	2.00	1.00
Planothidium	Plan	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.25	0.00
Rhopalodia	Rho	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
Sellophora	Sel	0.00	3.50	0.00	0.50	13.50	0.00	0.00	0.00	0.00	0.00	0.75	0.75	6.50
Stauroneis	Sta	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stausira	Stau	0.00	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.75	0.25
Stenopterobia	Ste	1.00	0.75	0.00	0.25	0.00	0.00	0.00	0.00	0.50	5.25	0.00	1.25	0.00
Suriella	Sur	0.75	15.25	0.00	0.00	0.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00
Synedra	Syn	1.00	1.75	0.00	1.25	5.25	1.25	4.75	0.00	0.00	0.00	0.75	0.00	0.50
Tryblionella	Try	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

References

- Abramoff, M. D., Magelhaes, P. J. & Ram, S.J. 2004, 'Image Processing with ImageJ', *Biophotonics International*, vol. 11, no. 7, pp. 36-42.
- Admiraal, W., Blanck, H., Buckert-de Jong, M., Guasch, H., Ivorra, N., Lehmann, V., Nyström, B. A. H., Paulsson, M. & Sabater, S. 1999, 'Short term toxicity of zinc to microbenthic algae and bacteria in a metal polluted stream', *Water research*, vol. 33, no. 9, pp. 1989-1996.
- Adshead-Simonsen, P. C., Murray, G. E. & Kushner, D. J. 1981, 'Morphological changes in the diatom *Tabellaria-flocculosa* induced by very low concentrations cadmium', *Bulletin of Environmental Contamination and Toxicology*, vol. 26, no. 6, pp. 745-748.
- Anderson, N. J. 1997, 'Historical changes in epilimnetic phosphorus concentrations in six rural lakes in Northern Ireland', *Freshwater Biology*, vol. 38, no. 2, pp. 427-440.
- Andresen, N. A. & Tuchman, M. L. 1991, 'Anomalous diatom populations in Lake Michigan and Huron in 1983', *J. Great Lakes Res.*, vol. 17, no. 1, pp. 144-149.
- Antoine, S. E. & Benson-Evans, K. 1986, 'Spatial and temporal distribution of some interesting diatom species in the River Wye system, Wales, UK', *Limnologica*, vol. 17, no. 1, pp. 79-86.
- ANZECC and ARMCANZ, 2000, *Guidelines for fresh and marine water quality in Australia and New Zealand*, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- APHA. 1992, *Standard methods for examination of waters and wastewaters*, 19th ed American Public Health Association, Washington, DC.
- Archibald, R. E. M. 1972, 'Diversity in some South African diatom associations and its relation to water quality', *Water Research*, vol. 6, pp. 1229-1238.
- Arrow, K., Bolin, B. R., Costanz, A. P., Dasgupt, A. C. Folke, C., Holling, S., Jansson, S., Levin K., Maler, G. C., Perring, A. S. N., Pimental, D. D. 1995, 'Economic growth, carrying capacity, and the environment', *Science*, vol. 268, pp. 520-521.
- Asai, K., Houki, A. & Sulaiman, A. 2002, *Water quality assessment of rivers of west Sumatra using epilithic diatom assemblages*, Ed. John, J., Proceeding of the 15th International Diatom Symposium, A.R.G. Gantner Verlag KG, Ruggell, Liechtenstein.
- Austin, M.P. 2002, 'Spatial prediction of species distribution: an interface between ecological theory and statistical modelling', *Ecol. Model.*, vol. 157, no, 2-3, pp. 101-118.
- Bain, M. B., Finn, J. T. & Brooke, H. E. 1988, 'Stream flow regulation and fish community structure', *Ecology*, vol. 69, pp. 382-392.
- Barber, H. G. & Carter, J. R. 1981, 'Observations of some deformities found in British diatoms', *Microscopy*, vol. 34, pp. 214-226.
- Batley, G. 2002, *Metal bioavailability in waters and sediments*, Ecotoxicological tools for environmental management conference, Commonwealth Department of Education, Science and Training, Canberra, p. 21.
- Battarbee, R. W. 1986, *Diatom Analysis*, Ed. Berglund, B. E, Handbook of Holocene Palaeoecology and Palaeohydrology, John Wiley, Chichester, pp. 527-570.

- Battarbee, R. W. 1999, 'The importance of palaeolimnology to lake restoration', *Hydrobiologia*, vol. 395, pp. 149-159.
- Battarbee, R.W., Jones, V.J., Flower, R. J., Cameron, N. G., Bennion, H., Carvalho, L. & Juggins, S. 2001, Diatoms. Eds. Smol, J. P., Birks, J. B. & Last, W. M. *Tracking environmental change using lake sediments*, volume 3: Terrestrial, Algal and Siliceous Indicators, Kluwer Academic Publishers, Dordrecht, The Netherlands. pp. 155-202.
- Behnke, A., Friedl, T., Chepurnov, V. A. & Mann, D. G. 2004, 'Reproductive compatibility and rDNA sequence analyses in the *Sellaphora pupula* species complex (*Bacillariophyta*)', *J. Phycol.*, vol. 40, pp. 193-208.
- Bellinger, B. J., Cocquyt, C. & O'Reilly, C. M. 2006, 'Benthic diatoms as indicators of eutrophication in tropical streams', *Hydrobiologia*, vol. 573, pp. 75-87.
- Belpaire, C., Smolder, R., Auweele, I. V., Erchken, D., Breine, J., Van Thuyne, G. & Ollevier, F. 2000, 'An index of biotic integrity characterizing fish populations and ecological quality of Flandrian water bodies', *Hydrobiologia*, vol. 434, pp. 17-33.
- Bennion, H. 1994, 'A diatom-phosphorus transfer function for shallow, eutrophic ponds in southeast England', *Hydrobiologia*, vol. 275/276, pp. 391-410.
- Bennion, H., Juggins, S., Anderson, N. J. 1996, 'Predicting epilimnetic phosphorus concentrations using an improved diatom-based transfer function and its application to lake eutrophication management', *Environmental Sci. Technol.*, vol. 30, no. 6, pp. 2004-2007.
- Beszteri, B., Acs, E., Makk, J., Kovacs, G., Marialigeti, K. & Kiss, K. T. 2001, 'Phylogeny of six naviculoid diatoms based on 18s rRNA sequences', *Int. J. Syst. Evol. Microbiol.*, vol. 51, pp. 1581-1586.
- Birks, H. J. B. 1995, Quantitative paleoenvironmental reconstructions. Eds. Maddy, D. & Brew, J. S., *Statistical Modelling of Quaternary Science Data. Technical Guide 5*, Quaternary Research Association, Cambridge, pp. 161-254
- Birks, H. J. B. 1998, 'Numerical tools in palaeolimnology — progress, potentialities, and problems', *Journal of Paleolimnology*, vol. 20, pp. 307-332.
- Birks, H. J. B., Berge, F., Boyle, J. F. & Cummin, B. F. 1990, 'A paleoecological test of the land-use hypothesis for recent lake acidification in South-West Norway using hill-top lakes', *Journal of Paleolimnology*, vol. 4, no. 1, pp. 69-86.
- Blanck, H. & Wängberg, S. 1988, 'Validity of an ecotoxicological test system – Short-term and long-term effects of arsenate on marine periphyton communities in laboratory systems', *Can. J. Fish. Aquat. Sci.*, vol. 45, pp. 1807-1815.
- Bornette, G., Amoros, C., Piegay, H., Tachet, J. & Hein, T. 1998, 'Ecological complexity of wetlands within a river landscape', *Biological Conservation*, vol. 85, pp. 35-45.
- Boulton, A. J. & Brock, M. A. 1999, *Freshwater ecology: Processes and Management*, Gleneagles Publishing, Australia.
- Bowling, L. C., Banks, M. R., Croome, R. L. & Tyler, P. A. 1993, 'Reconnaissance limnology of Tasmania. II. Limnological features of Tasmanian freshwater coastal lagoons', *Arch. Hydrobiol.*, vol. 126, pp. 385-403.
- Brand, L. E. 1990, 'Review of genetic variation in marine phytoplankton species and the ecological implications', *Biol. Ocean.*, vol. 6, pp. 397-409.

- Braek, G. S., & Jensen, A. & Mohus, A. 1976, 'Heavy metal tolerance of marine phytoplankton. III. Combines effects of copper and zinc ions on cultures of four common species', *J. Exp. Mar. Biol. Ecol.*, vol. 25, pp. 37-50.
- Brand, L. E., Guillard, R. R. L. & Murphy, L. S. 1981, 'A method for the rapid and precise determination of acclimated phytoplankton reproduction rates', *J. Plankton Res.*, vol. 3, pp. 193–201.
- Breen, P. F. 1996, Diatoms, ecosystem health and water quality biomonitoring. Diatoms and nutrients: A taxonomic workshop, Deakin University, pp. 1-20.
- Brodie, J. E. & Mitchell, A. W. 2005, 'Nutrients in Australian tropical rivers: changes with agricultural development and implications for receiving environments', *Marine & Freshwater Research*, vol. 56, pp. 279-302.
- Brown, P. L. & Ferris, J. M. 1994, 'Risk-based assessment method for impact on riverine ecosystems', *Australian Journal of Chemistry*, vol. 57, no. 10, pp. 951-955.
- Brown, P. L. & Ferris, J. M. 2004, 'Risk-based assessment of the impact of aluminium on a riverine ecosystem', *Aust. J. Chem.*, vol. 57, pp. 951-955.
- Brown, P.L., Haworth, A., Sharland, S. M. & Tweed, C.J. 1991, *HARPHRQ: A geochemical speciation program based on PHREEQE*, Nirex Safety studies, Report 188, Oxon, UK.
- Brown, P. L., Markich, S. J. & Jeffree, R. A. 1994, 'Migration of Uranium: Integrating geochemistry with biomonitoring to evaluate and predict its environmental impact', *Radiochemica Acta*, vol. 66/67, pp. 351-357.
- Burgman, M. A & Lindenmayer, D. B. 1998, *Conservation biology for the Australian environment*, Ed. Drill, C., Surrey Beatty, Chipping Norton, N.S.W.
- Cairns, J., McCormick, P. V. & Niederlehner, D. B. R. 1993, 'A proposed framework for developing indicators of ecosystem health', *Hydrobiologia*, vol. 263, pp. 1-44.
- Cao, Y., Hawkins, C. P. & Vinson, M. R. 2003, 'Measuring and controlling data quality in biological assemblage surveys with special reference to stream benthic macroinvertebrates', *Freshwater Biol.*, vol. 48, no. 10, pp. 1898-1911.
- Carpenter, S. R., Frost, T. F., Heisey, D. & Kratz, T. K. 1989, 'Randomized Intervention Analysis and the interpretation of whole-ecosystem experiments', *Ecology*, vol. 70, pp. 1142–1152.
- Carpentaria Gold Pty Ltd. 1994, *Report Toms gully mine water quality monitoring April 1993 site visits*, Carpentaria Gold Pty Ltd.
- Carter, J. R. 1990, *A new Eunotia and its great morphological variations under stress caused by habitat loaded with copper salts*, Ouvrage dedie a H. Germain, Koeltz scientific books, Koenigstein, pp. 13-17.
- Cattaneo, A., Couillard, Y., Wunsam, S., & Courcelles, M. 2004, 'Diatom taxonomic and morphological changes as indicators of metal pollution and recovery in Lac Dufault (Quebec, Canada)', *J. Paleolimnol.*, vol. 32, no. 2, pp. 163-175.
- Cerino, F., Orsini, L., Sarno, D., Dell'Aversano, C., Tartaglione, L. & Zingone, A. 2005, 'The alternation of different morphotypes in the seasonal cycle of the toxic diatom *Pseudo-nitzschia galaxiae*', *Harmful Algae*, vol. 4, no. 1, pp. 33-48.

- Chaney, J. A., Thomas, D. P. & Tyler, P. A. 1979, *Diatoms and other freshwater algae of the Magellan Creek system (Alligator Rivers Region), Northern Territory, as monitors of the heavy metal pollution*. Supervising Scientist for the Alligator Rivers Region, open file record 3, Canberra.
- Charles, D. F. 1996, Use of algae for monitoring rivers in the United States: some examples. Eds. Whitton, B. A., Rott, E., *Use of Algae for monitoring rivers II*, Institut für Botanik, Universität Innsbruck, Innsbruck Austria, pp. 109-118.
- Charles, D. F. & Smol, J. P. 1990, 'The PIRLA II project: Regional assessment of lake acidification trends', *Verh. Int. Verein. Limnol.*, vol. 24, pp. 474-480.
- Charles, D. F. & Smol, J. P. 1994, Long term changes in lakes: quantitative inferences using biotic remains in the sediment record, Ed. Barker, L., *Environmental chemistry of lakes and reservoirs: advances in chemistry*, series 237, American Chemical Society Publisher, Washington DC, pp. 3-31.
- Charles, D. F. & Whitehead, P. G. 1986, 'The PIRLA project: Paleoecological investigations of recent lake acidification', *Hydrobiologia*, vol. 143, pp. 13-20.
- Chessman, B. C. 1985a, 'Phytoplankton of the La Trobe River, Victoria', *Austr. J. Mar. Freshwat. Res.*, vol. 35, pp. 115-122.
- Chessman, B. C. 1985b, 'Artificial-substratum periphyton and water quality in the Lower La Trobe River, Victoria', *Aust. J. Mar. Freshwat. Res.*, vol. 36, pp. 855-871.
- Chessman, B. C. 1986, 'Diatom flora of an Australian river system: spatial patterns and environmental relationships', *Freshwat. Biol.*, vol. 16, pp. 805-819.
- Chessman, B. C., Grouns, I. O., Currey, J. & Plunkett-Cole, N. 1999, 'Predicting diatom communities at the genus level for the rapid biological assessment of rivers', *Freshwater Biology*, vol. 41, pp. 317-331.
- Chessman, B. C., Bate, N., Gell, P. A. & Newall, P. 2007, 'A diatom species index for bioassessment of Australian rivers', *Marine and Freshwater Research*, vol. 58, no. 6, pp. 542-557.
- Coring, E., Hamm, A. & Hofmann, G. 1999, Durchgehendes Trophiesystem auf der Grundlage der Trophieindikation mit Kieselalgen. *DVWK Materialien*, series 6, Deutscher Verband für Wasserwirtschaft und Kulturbau e.V., Bonn.
- Cox, E. J. 1991, What is the basis for using diatom as monitors of river quality?, Eds. Whitton, B. A., Rott, E., Friedrich, G., *Use of Algae for monitoring rivers*, Institut für Botanik, Universität Innsbruck, Innsbruck, Austria, pp. 33-40.
- Cox, E. J. 1993, 'Fresh-water diatom ecology-Developing an experimental approach as an aid to interpreting field data', *Hydrobiologia*, vol. 269, pp. 447-452.
- Cox, E. J. 1995, Morphological variation in widely distributed diatom taxa: taxonomic and ecological implications, Eds. Marino, D., Montresor, M., *Proceedings of the 13th Diatom Symposium*, Biopress, Bristol., pp. 335-345.
- Cox, E. J. 1996, *Identification of Freshwater Diatoms from live Material*, Chapman & Hall, London, 158 pp.
- Cumming, B.F. & Smol, J. P. 1993, 'Development of diatom-based salinity models for paleoclimatic research from lakes in British Columbia (Canada)', *Hydrobiologia*, vol. 269/270, pp. 179-196.

- Cummins, C. P. 1994, Acid solutions, Ed. Calow, P., *Handbook of ecotoxicology*, vol. 2, Blackwell Scientific Publishers, p. 21-44.
- Cunningham, L., Raymond, B., Snape, I. & Riddle, M. J. 2005, 'Benthic diatom communities as indicators of anthropogenic metal contamination at Casey Station', *Antarctica, J. Paleolimnol.*, vol. 33, no. 4, pp. 499-513.
- DeNicola, D. M. 2000, 'A review of diatoms found in highly acidic environments', *Hydrobiologia*, vol. 433, no. 1-3, pp. 111-122.
- Deniseger, J., Austin, A. & Lucey, W. P. 1986, 'Periphyton communities in a pristine mountain stream above and below heavy metal mining operations', *Freshwat. Biol.*, vol. 16, pp. 209-218.
- Denys, L. & van Straaten, D. 1992, 'A survey of the acid water diatom assemblages of two heathland relics in the Belgian Northern campine (Groot and klein schietveld, Brasschaat) with an assessment of their conservational value', *Diatom Research*, vol. 7, no. 1, pp. 1-13.
- Descy, J. P. 1979, 'A new approach to water quality estimation using diatoms', *Nova Hedwigia*, vol. 64, no. 305-323.
- Descy, J. P. & Coste, M. 1990, *Utilisation des diatomées benthiques pour l'évaluation de la qualité des eaux courants*, Rapport Final, EC contract B-71-23, Univ. Namur-CEMAGREFF, Bordeaux.
- Dickman, M. D. 1998, 'Benthic marine diatom deformities associated with contaminated sediments in Hong Kong', *Environ. Int.*, vol. 24, no. 7, pp. 749-759.
- Dickman, M. D., Yang, J. R. & Brindle, I. D. 1990, 'Impacts of heavy metals on higher aquatic plant, diatom and benthic invertebrate communities in the Niagara River watershed near Welland, Ontario', *Water Pollution Research Journal of Canada*, vol. 25, no. 2, pp. 131-159.
- Dixit, S. S., Cumming, B. F., Birks, H. J. B., Smol, J. P., Kingston, J. C., Uutula, A. J., Charles, D. F. & Camburn, K. E. 1993, 'Diatom assemblages from Adirondack lakes (New York, USA) and the development of inference models for retrospective environmental assessment', *Journal of Paleolimnology*, vol. 8, pp. 27-41.
- Dixit, A. S., Dixit, S. S. & Smol, J. P. 1992a, 'Algal microfossils provide high temporal resolution of environmental trends', *Water Air and Soil Pollution*, vol. 62, no. 1-2, pp. 75-87.
- Dixit, S. S. & Smol, J. P. 1994, 'Diatoms as indicators in the environmental monitoring and assessment program – Surface Water (EMAP-SW)', *Environ. Monit. Assess.*, vol. 31, no. 3, pp. 275-306.
- Dixit, S. S. & Smol, J. P. 1995, 'Diatom evidence of past water quality changes in the Adirondack seepage lakes', *Diatom Research*, vol. 10, no. 1, pp. 113-129.
- Dixit, S., Smol, J. P., Kingston, J. C. & Charles, D. F. 1992b, 'Diatoms: powerful indicators of environmental change', *Environ. Sci. Technol.*, vol. 26, no. 1, pp. 23-33.
- Dokulil, M. T., Schmidt, R. & Kofler, S. 1997, 'Benthic diatom assemblages as indicators of water quality in an urban flood-water impoundment, Neue Donau, Vienna, Austria', *Nova Hedwigia*, vol. 65, no. 1-4, pp. 273-284.
- Douglas, G. E., John, D. M., Williamson, D. B. & Reid, G. 1998, 'The aquatic algae associated with mining areas in Peninsula Malaysia and Sarawak: their composition, diversity and distribution', *Nova Hedwigia*, vol. 67, no. 1-2, pp. 189-211.

- Droop, S. J. M. 1994, 'Morphological variation in *Diploneis smithii* and *D. fusca* (Bacillariophyceae)', *Arch. Protistenkd.*, vol. 144, pp. 249-270.
- Droop, S. J. M., Mann, D. G. & Lokhorst, G. M. 2000, 'Spatial and temporal stability of demes in *Diploneis smithii*/ *D. fusca* (Bacillariophyta) supports a narrow species concept', *Phycologia*, vol. 39, pp. 527-546.
- Dufrene, M. & Legendre, P. 1997, 'Species assemblages and indicator species: the need for a flexible asymmetrical approach', *Ecological Monographs*, vol. 67, pp. 345-366.
- Edlund, M. B. & Jahn, R. 2001, Report of a workshop on 'Biogeography and Endemism of Diatoms', Ed. Economou-Amilli, A., *Proceedings of the 16th International Diatom Symposium*, University of Athens, Greece, pp. 575-588.
- Erskine, W. D., Saynor, M. J., Erskine, L., Evans, K. G. & Moliere, D. R. 2005, 'A preliminary typology of Australian tropical rivers and implications for fish community ecology', *Marine and Freshwater Research*, vol. 56, pp. 253-267.
- Fairweather, P. G. & Napier, G. M. 1998, Environmental Indicators for National State of the Environment Reporting: inland waters', *Australia: State of the Environment* (Environmental Indicator Reports), CSIRO Land Water, Department of the Environment, Canberra.
- Ferris, J.M., & Vyverman, W. 1996, Tropical benthic diatoms in a pollution gradient associated with acid rock drainage, *INTECOLS Wetlands Conference*, Perth, WA.
- Ferris, J. M., Vyverman, W., Gell, P. & Brown, P. L. 2002, Diatoms as biomonitors in two temporary streams affected by acid drainage from disused mines. Eds. Markich, S. J., Jeffree, R. A., *The Finnis River a natural laboratory of mining impacts—past, present and future, The Finnis River Symposium*, Darwin, August 2001, Australian Nuclear Science and Technology Organisation. Sydney.
- Fisher, N. S., Jones, G. J. & Nelson, D. M. 1981, 'Effects of Copper and zinc on growth, morphology, and metabolism of *Asterionella japonica* (Cleve)', *J. Exp. Mar. Biol. Ecol.*, vol. 51, pp. 37-56.
- Foged, N. 1978, Diatoms in eastern Australia, *Bibliotheca Phycologia*, band 41, pp. 1-243.
- Fore, L. S. & C. Grafe, 2002, 'Using diatoms to assess the biological condition of large rivers in Idaho (USA)', *Freshwater Biology*, vol. 47, pp. 2015-2037.
- Fostner, U. & Whittmann, M. 1981. *Metal Pollution in the aquatic environment*, 2nd edition, Springer-Verlag, Germany
- Fox, R. E. & Jan, G. 2000, *The role of audit in mine site rehabilitation in the Northern Territory*, Abstract of a presentation to Remade Lands 200 – International Conference on the remediation and Management of Degraded Lands, Fremantle, Australia
- Gallagher, J. C. 1980, 'Population genetics of *Skeletonema costatum* (Bacillariophyceae) in Narragansett Bay', *Journal of Phycology*, vol. 16, pp. 464-474.
- Gasse, F., Juggins, S. & Khelifa, L. B. 1995, 'Diatom-based transfer-functions for inferring past hydrochemical characteristics of African Lakes', *Palaeogeogr. Palaeoclimatol.*, vol. 117, no. 1-2, pp. 31-54.
- Gell, P. A. 1997, 'The development of a diatom database for inferring lake salinity, western Victoria, Australia: towards a quantitative approach for reconstructing past climates', *Aust. J. Bot.*, vol. 45, no. 4, pp. 735-735.

- Gell, P., Tibby, J. & Townsend, S. 2002, The relationship between diatom assemblages and water quality, Ed. Townsend, S. A., *Periphyton and Phytoplankton Response to reduced Dry Season Flows in the Daly River*, Department of Infrastructure, Planning and Environment, Darwin, N.T., pp 104-135.
- Gell, P., Wallbrink, P., Tassicker, G. & Illman, M. 1999, Secrets in the sediments: a history of sediment and pollution loads in the Lower Torrens River, S.A., Eds. Rutherford, I. & Bartley, R. *Second Australian Stream Management Conference: The Challenge of Rehabilitating Australia's Streams*, CRC Catchment Hydrology, Melbourne, pp. 287-292.
- Genter, R. B., Cherry, D. S., Smith, E. P. & Cairns, J. Jr. 1987, 'Algal-periphyton population and community changes from inc stress in stream mesocosms', *Hydrobiologia*, vol. 153, pp. 261-275.
- Genter, R. B. & Lehman, R. M. 2000, 'Metal toxicity inferred from algal population density, heterotrophic substrate use, and fatty acid profile in a small stream', *Environmental Toxicology and Chemistry*, vol. 19, pp. 869-878.
- Godhe, A., McQuoid, M. R., Karunasagar, I., Karunasagar, I. & Rehnstam-Holm, A. 2006, 'Comparison of three common molecular tools for distinguishing among geographically separated clones of the diatom *Skeletonema marinoi* sarno et zingone (Bacillariophyceae)', *J. Phycol.*, vol. 42, pp. 280-291.
- Gómez, N. 1998, 'Use of epipellic diatoms for evaluation of water quality in the Matanza-Riachuelo (Argentina), a pampean plain river', *Water Res.*, vol. 32, no. 7, pp. 2029-2034.
- Gómez, N. & Licursi, M. 2001, 'The Pampean Diatom Index (IDP) for assessment of rivers and streams in Argentina', *Aquatic Ecology*, vol. 35, pp. 173-181.
- Gorman, O. T. & Karr, J. R. 1978, 'Habitat structure and stream fish communities', *Ecology*, vol. 59, pp. 507-515.
- Goudie, A. 1993, *The Human Impact on the Natural Environment*, 4th Edition, Blackwell, Oxford, UK.
- Gray, N. F. 1998, 'Acid mine drainage composition and the implications for its impact on lotic systems', *Water Res.*, vol. 32, no. 7, pp. 2122-2134.
- Growns, I. 1999, 'Is genus or species identification of periphytic diatoms required to determine the impacts of river regulation?', *Journal of Applied Phycology*, vol. 11, pp. 273-283.
- Growns, I. O. & Growns, J. E. 2001, 'Ecological effects of flow regulation on macroinvertebrate and periphytic diatom assemblages in the Hawkesbury-Nepean River, Australia', *Regul. River*, vol. 17, no. 3, pp. 275-293.
- Guillard, R. R. & Lorenzen, C. J. 1972, 'Yellowgreen algae with chlorophyllide', *J. Phycol.*, vol. 8, pp. 1-14.
- Gunderson, L. H., Pritchard, L., Holling, C. S., Folke, C. & Peterson, G. D. 2002, A summary and synthesis of resilience in large-scale systems, Eds. Gunderson, L. H. & Pritchard, L., *Resilience and the behaviour of large-scale systems*, Island press, Washington.
- Gustavson, K. & Wänberg, S. A. 1995, 'Tolerance induction and succession in microalgae communities exposed to copper and atrazine', *Aquatic Toxicology*, vol. 32, pp. 283-302.
- Hall, T. A. 1999, 'BioEdit: a user-friendly biological sequence alignment editor and analysis program for windows 95/98/NT', *Nucl. Acids. Symp.*, Ser. 41, pp. 95-98.

- Hall, R. I., Smol, J. P. 1992, 'A weighted averaging regression and calibration model for inferring total phosphorus concentration from diatoms in British-Columbia (Canada)', *Lakes Freshwater Biol.*, vol. 27, no. 3, pp. 417-434.
- Hamilton, P. B., Douglas, M. S., Fritz, V., Sherilyn, C., Pienitz, R., Smol, J. P. & Wolfe, A. P. 1994, 'A compiled freshwater diatom taxa list for the arctic and subarctic regions of North America', *Canadian Technical Report of Fisheries and Aquatic Sciences*, vol 10, pp. 85-102.
- Hamilton, S. K. & Gehrke, P. C. 2005, 'Australia's tropical river systems: current scientific understanding and critical knowledge gaps for sustainable management', *Marine and Freshwater Research*, vol. 56, pp. 243-252.
- Harding, J. P. C. & Whitton, B. A. 1976, 'Resistance to zinc of *Stigeoclonium tenue* in the field and the laboratory', *Br. Phycol. J.*, vol. 11, pp. 417-426.
- Harper, M. A. 1999, Diatoms as markers of atmospheric transport, Eds. Stroermer, E. F. & Smol, J. P., *The diatoms: Applications for the environmental and earth sciences*, Cambridge University Press, Cambridge, pp. 429-435.
- Harris, D. L., Lottermoser, B. G. & Duchesne, J. 2003, 'Ephemeral acid mine drainage at the Montalbion silver mine, north Queensland', *Australian Journal of Earth Sciences*, vol. 50, pp. 797-809.
- Hart, B. T. & Campbell, I. C. 1991, Water Quality Guidelines and the Maintenance of Australian River Ecosystems, *Water Allocation for the Environment*, Proceedings of an International Seminar and Workshop, AWRC/ANZECC.
- Hart, B. T., Maher, B. & Lawrence, I. 1999, 'New generation water quality guidelines for ecosystem protection', *Freshwater Biology*, vol. 41, pp. 347-359.
- Hayworth, E. Y. & Tyler, P. A. 1993, 'Morphology and taxonomy of *Cyclotella tasmanica* sp. nov. a new described diatom from a Tasmanian Lake', *Hydrobiologia*, vol 269/270, pp. 47-56.
- Hirst, H., Jüttner, I. & Ormerod, S. J. 2002, 'Comparing the responses of diatoms and macro-invertebrates to metals in upland streams of Wales and Cornwall', *Freshwater Biology*, vol. 47, no. 9, pp. 1752-1765.
- Hill, B. H., Herlihy, A. T., Kaufmann, P. R., Stevenson, R. J., McCormick, F. H. & Johnson, C. B. 2000, 'Use of periphyton assemblage data as an index of biotic integrity', *J. North American Benthol. Soc.*, vol. 19, no. 1, pp. 50-67.
- Hill, B. H., Stevenson, R. J., Pan, Y., Herlihy, A. T., Kaufmann, P. R. & Johnson, C. B. 2001, 'Comparison of correlations between environmental characteristics and stream diatom assemblages characterized at genus and species levels', *Journal of the North American Benthological Society*, vol. 20, no. 2, pp. 299-310.
- Hillebrand, H. & Sommer, U. 2000, 'Diversity of benthic microalgae in response to colonization time and eutrophication', *Aquat. Bot.*, vol. 67, no. 3, pp. 221-236.
- Hirst, H., Jüttner, I. & Ormerod, S. J. 2002, 'Comparing the responses of diatoms and macroinvertebrates to metals in upland streams of Wales and Cornwall', *Freshwater Biology*, vol. 47, pp. 1752-1765.
- Ho, S. C. & Peng, T. S. 1997, 'The use of river plankton and fish in water quality classification of Sg. Perai, Sg. Juru and Sg. Perlis.', *J. Ensearch.*, vol. 10, no. 2, pp. 115-124.

- Hodgson, D. Tyler, P.A. & Vyverman, W. 1997, 'The palaeolimnology of Lake Fidler, a meromictic lake in south-west Tasmania and the significance of recent human impact', *J. Paleolimn.*, vol. 19, pp. 313-333.
- Holling, C. S. 1973, 'Resilience and stability of ecological systems', *Annual Review of Ecology and Systematics*, vol. 4, pp. 1-23.
- Hotzel, B. G. & Croome, R. 1999, *A phytoplankton methods manual for Australian freshwaters*, Occasional paper 22, Land and Water Resources research & Development Corporation, Canberra.
- Hustedt, F. 1937-39, 'Systematische und ökologische Untersuchungen über den Diatomeen-Flora von Java, Bali, Sumatra.', *Archiv für Hydrobiologie*, supp. 1, vol. 15, pp. 131-177, pp. 187-295, pp. 393-506 & pp. 638-790, vol. 16, pp. 1-155 & pp. 274-394.
- Ivorra, N., Bremer, S., Guasch, H., Kraak, M. H. S. & Admiraal, W. 2000, 'Differences in the sensitivity of benthic microalgae to Zn and Cd regarding biofilm development and exposure history', *Environ. Toxicol. Chem.*, vol. 19, no. 5, pp. 1332-1339.
- Ivorra, N., Hettelaar, J. Kraak, M. H. S., Sabater, S. & Admiraal, W. 2002, 'Responses of biofilms to combined nutrient and metal exposure', *Environmental Toxicology and Chemistry*, vol. 21, no. 3, pp. 626-632.
- Izsak, C., Price, A. R. G., Hardy, J. T. & Basson, P.W. 2002, 'Biodiversity of periphyton (diatoms) and echinoderms around a refinery effluent, and possible associations with stability', *Aquatic Ecosystem Health & Management*, vol. 5, no. 1, pp. 61-70.
- Jahn, R. 1986, A study of *Gomphonema augur* Ehrenberg: the structure of the frustule and its variability in clone and populations, Ed. Ricard, M., *Proceedings of the 8th Diatom Symposium*, Koeltz, Königstein, pp. 191-204.
- Jambor, J. L., Nordstrom, D. K. & Alpers, C. N. 2000, Metal-sulfate salts from sulfide mineral oxidation. Eds. Alpers, C. N., Jambor, J. L. & Nordstrom, D. K., *Sulfate Minerals: Crystallography, Geochemistry, and Environmental Significance*, Reviews in Mineralogy and Geochemistry, series 40., pp. 303-350.
- Janssen, C. R., De Schamphelaere, K., Heijerick, D., Muysen, B., Lock, K., Bossuyt, B., Vangheluwe, M. & Van Sprang, P. 2000, 'Uncertainties in the environmental risk assessment of metals', *Human and Ecological Risk Assessment*, vol. 6, no. 6, pp. 1003-1018.
- John, J. 1980, 'Two new species of diatom, *Mastogloia*, from Western Australia', *Nova Hedwigia*, vol. 33, pp. 849-858.
- John, J. 1981a, 'New species of freshwater diatoms from Western Australia', *Nova Hedwigia*, vol. 34, pp. 569-576.
- John, J. 1981b, '*Amphora australiensis* sp. nov.', *Nova Hedwigia*, vol. 35, pp. 39-53.
- John, J. 1981c, 'Three new taxa of diatom from Western Australia', *Cyptogamie Algologie*, vol. 11, no. 2, pp. 131-139.
- John, J. 1983, 'The diatom flora of the Swan River Estuary, western Australia', *Bibl. Phycologia*, vol. 64, pp. 1-360.
- John, J. 1993, 'The use of diatoms in monitoring the development of created wetlands at a sandmining site in Western Australia', *Hydrobiologia*, vol. 269/270, pp. 427-436.

- John, J. 1998, An overview of health assessment of rivers and streams in south-west Australia using diatoms, *The 15th International Diatom Symposium*, Koeltz Scientific, pp.89-102
- John, J. 2000a, *Diatom prediction and classification system of urban streams*, LWRRDC, Occasional paper 13/99, report 6, Canberra, 157 pp.
- John, J. 2000b, *A guide to diatoms as indicators of urban stream health*, LWRRDC, Occasional paper 14/99, report 7, Canberra, 182 pp.
- Jolly, P. 2004, Interaction between groundwater and surface waters in the wet dry tropics of northern Australia, Eds. Gehrke, P., Bristow, K., Bunn, S., Douglas, M., Edgar, B., Finlayson, M., Hamilton, S., Loneragan, N., Lund, M., Pearson, R., Prosser, I. & Robson, C. , *Sustainable Futures for Australia's Tropical rivers: The role of science in managing tropical rivers, wetlands, estuaries and coastal ecosystems*, Charles Darwin University, CSIRO tech report 17/04, 20 pp.
- Jones, D., Klessa., D., Stockton, D. & Puhlovich, A. 2002, *Dewatering of Cosmo Howley Mine water Dam*, Report for Burnside Operations Pty Ltd, EWL Sciences Pty Ltd., 20 pp.
- Jones, V. J. & Juggins, S. 1995, 'The construction of a diatom-based chlorophyll a transfer function and its application at three lakes on Signy Island (maritime Antarctic) subject to differing degrees of nutrient enrichment', *Freshwater Biol.*, vol. 34, no. 3, pp. 433-445.
- Juggins, S. 1992, Diatoms in the Thames estuary, England: Ecology, palaeoecology, and salinity transfer function, *Bibliotheca Diatomologica*, vol. 25, 216 pp.
- Juggins, S. 2003, *C2 User guide. Software for ecological and palaeoecological data analysis and visualisation*, University of Newcastle, Newcastle upon Tyne, UK, 69 pp.
- Jüttner, I., Rothfritz, H. & Ormerod, S. J. 1996, 'Diatoms as indicators of river quality in the Nepalese Middle Hills with consideration of the effects of habitat-specific sampling', *Freshwater Biol.*, vol. 36, no. 2, pp. 475-486.
- Jüttner, I., Sharma, S., Dahal, B. M., Ormerod, S. J., Chimonides, P. J. & Cox, E. J. 2003, 'Diatoms as indicators of stream quality in the Kathmandu Valley and Middle Hills of Nepal and India', *Freshwater Biology*, vol. 48, no. 11, pp. 2065-2084.
- Karr, J. R. 1991, 'Biological integrity - A long neglected aspect of water-resource management', *Ecol. Appl.*, vol. 1, no. 1, pp. 66-84.
- Karr, J. R. 1995, Ecological integrity and ecological health are not the same, Ed. Schulze, P., *Engineering within ecological constraints*, National Academy of Engineering, National Academy Press, Washington, DC., pp. 1-15.
- Karr, J. R. 1999, 'Defining and measuring river health', *Freshwater Biology*, vol. 41, pp. 221-234.
- Karr, J. R. & Chu, E.W. 1999, *Restoring Life in Running Waters: Better Biological Monitoring*, Island Press, Washington D.C., pp. 1-207.
- Karr, J. R & Thomas, T. 1996, 'Economics, ecology and environmental quality', *Ecological applications*, vol. 6, pp. 31-32.
- Kelly, M. G. 1988, *Mining and the freshwater environment*, Elsevier Applied Science, London, 231 pp.
- Kelly, M. G., Penny, C. J. & Whitton, B. A. 1995, 'Comparative Performance of Benthic Diatom Indices Used to Assess River Water Quality', *Hydrobiologia*, vol. 302, pp. 179-188.

- Kelly, M. G. & Whitton, B. A. 1989, 'Interspecific differences in Zn, Cd and Pb accumulation by freshwater algae and bryophytes', *Hydrobiologia*, vol. 175, pp. 1-11.
- Kelly, M. G. & Whitton, B. A. 1995, 'The Trophic Diatom Index: a new index for monitoring eutrophication in rivers', *J. Applied Phycology*, vol. 7, no. 4, pp. 433-444.
- Khan, I. 1991, 'Effect of urban and industrial-wastes on species-diversity of the diatom community in a tropical river, Malaysia', *Hydrobiologia*, vol. 224, no. 3, pp. 175-184.
- Kociolek, J. P. & Rhode, K. 1998, 'Raphe vestiges in "Asterionella" species from Madagascar: evidence for a polyphyletic origin of the araphid diatoms?', *Cryptogamie Algologie.*, vol. 19, pp. 57-74.
- Kociolek, J. P. & Spaulding, S. A. 2000, 'Freshwater diatom biogeography', *Nova Hedwigia*, vol. 71, no. 1-2, pp. 223-241.
- Kociolek, J. P., Spaulding, S. A., Sabbe, K. & Vyverman, W. 2004, 'New *Gomphonema* (Bacillariophyta) species from Tasmania', *Phycologia*, vol. 43, no. 4, pp. 427-444.
- Kociolek, J. P. & Stroermer, E. F. 1988, Taxonomy, ultrastructure, and distribution of *Gomphoneis herculeana*, *G. erianse* and closely related species, *Proceedings of the Academy of natural sciences of Philidephia*, pp. 24-97.
- Kociolek, J. P. & Stroemer, E. F. 2001, 'Taxonomy and ecology: a marriage of necessity', *Diatom Research*, vol. 16, no. 2, pp. 433-442.
- Korsman, T. & Birks, H. J. B. 1996, 'Diatom-based water chemistry reconstructions from northern Sweden: A comparison of reconstruction techniques', *J. Paleolimnol.*, vol. 15, no. 1, pp. 65-77.
- Kraatz, M. 1998, *Rum Jungle Rehabilitation Project Monitoring Report 1988-1993*, Technical Report No. R97/2, Lands, Planning and Environment Dept., Darwin, NT.
- Kraatz, M. & Applegate. R. J., 1992, *Rum Jungle Rehabilitation Project Monitoring Report, 1986-1988*, Technical Memorandum No. 51, Land Conservation Unit, Conservation Commission of the Northern Territory, Darwin, NT.
- Krammer, K. 1992, Pinnularia Eine Monographie der Europäischen Taxa (Pinnularia - a monograph on the European taxa), *Bibliotheca Diatomologica*, Band 26, pp. 1-353.
- Krammer, K. 2000, The genus Pinnularia, Ed. Lange-Bertalot, H., *Diatoms of Europe: Diatoms of the European Inland Waters and Comparable Habitats*, volume 1, 703 pp.
- Krammer, K. 1997. Die cymbelloiden Diatomeen, Teil 2. Eine Monographie der weltweit bekannten Taxa Encyonema part., Encyonopsis and Cymbellopsis (Cymbelloid diatoms. A monograph on the known taxa worldwide. Part 2: Encyonema part., Encyonopsis and Cymbellopsis.), *Bibliotheca Diatomologica*, Band 37, 469 pp.
- Krammer, Kurt. 1997, Die cymbelloiden Diatomeen, Teil 1. Eine Monographie der weltweit bekannten Taxa Allgemeines und Encyonema Part (Cymbelloid diatoms - A monograph of the known taxa worldwide. General remarks and Encyonema Part. 1), *Bibliotheca Diatomologica*, Band 36, 382 pp.
- Krammer, K. 1992, Pinnularia eine Monographie der europaischen taxa. Berlin, *Bibliotheca Diatomologica*, Band 26, 535 pp.

- Krammer, K. 2002, Cymbella, Ed. Lange-Bertalot, H., *Diatoms of Europe: Diatoms of the European Inland Waters and Comparable Habitats*, volume 3, Koeltz Scientific Books, Königstein Germany, 584 pp.
- Krammer, K. & Lange-Bertalot, H. 1986, *Süßwasserflora von Mitteleuropa. Bacillariophyceae*, Teil i: *Naviculaceae*, Gustav Fischer Verlag, Stuttgart, 876 pp.
- Krammer, K. & Lange-Bertalot, H. 1988, *Süßwasserflora von Mitteleuropa. Bacillariophyceae* Teil ii: *Bacillariaceae, Epithemiaceae, Surirellaceae.*, Gustav Fischer Verlag, Stuttgart, 576 pp.
- Krammer, K. & Lange-Bertalot, H. 1991a, *Süßwasserflora von Mitteleuropa. Bacillariophyceae* Teil iii: *Centrales, Fragilariaceae, Eunotiaceae.*, Gustav Fischer Verlag, Stuttgart, 596 pp.
- Krammer, K. & Lange-Bertalot, H. 1991b, *Süßwasserflora von Mitteleuropa. Bacillariophyceae* Teil iv: *Achnantheaceae.*, Gustav Fischer Verlag, Stuttgart, 437 pp.
- Kwandrans, J. 1993, 'Diatom communities of acidic mountain streams in Poland', *Hydrobiologia*, vol. 269/270, pp. 335–342.
- Lampkin, A. J. & Sommerfeld, M. R. 1982, 'Algal distribution in a small, intermittent stream receiving acid mine-drainage', *Journal of Phycology*, vol. 18, pp. 196-199.
- Lane, C. R. 2007, 'Assessment of isolated wetland condition in Florida using epiphytic diatoms at genus, species, and subspecies taxonomic resolution', *Eco. Health*, vol. 4, pp. 219–230.
- Lange-Bertalot, H. 1979, 'Pollution tolerance as a criterion for water quality estimation', *Nova Hedwigia*, vol. 64, pp. 285-304.
- Lange-Bertalot, H. 2001, *Navicula sensu stricto*, 10 Genera Separated from *Navicula sensu stricto*, *Frustulia*, Ed. Lange-Bertalot, H., *Diatoms of Europe: Diatoms of the European Inland Waters and Comparable Habitats*, volume 2, Koeltz Scientific Books, Königstein Germany, 526 pp.
- Lange-Bertalot, H. & Metzeltin, D. 1996, Ecology-diversity-taxonomy. Indicators of oligotrophy. *Ionographia Diatomologica*, volume 2, Koeltz Scientific Books, Königstein, 390 pp.
- Leland, H. V. & Carter, J. L. 1984, 'Effects of copper on species composition of periphyton in a Sierra Nevada California USA stream', *Freshwater Biology*, vol. 14, no. 3, pp. 281-296.
- Lewis, R. J., Jensen, S. I., Denicola, D. M., Miller, V. I., Hoagland, K. D. & Ernst, S. G. 1997, 'Genetic variation in the diatom *Fragilaria capucina* (Fragilariaceae) along a latitudinal gradient across North America', *Pl. Syst. Evol.*, vol. 204, pp. 99-108.
- Li, H., & Reynolds, J. E. 1994, 'A simulation experiment to quantify spatial heterogeneity in categorical maps', *Ecology*, vol. 75, pp.2446-2455.
- Lindgaard, K. 1995, Classification of waterbodies and pollution, Eds. Armitage, P. D., Cranston, P. S., Pinder, L. C. V., *Chironomidae: biology and ecology of non-biting midges*, Chapman and Hall London, pp. 385-404.
- Line, J. M., Ter Braak, C. J. F. & Birks, H. J. B. 1994, 'WACALIB version 3.3: A computer program to reconstruct environmental variables from fossil assemblages by weighted averaging and to derived sample-specific errors of prediction', *Journal of Paleolimnology*, vol. 10, no. 2, pp. 147-152.
- Lobo, E. A., Callegaro, V. L. M., Oliveira, M. A., Salomoni, S. E., Schuler, S. & Asai, K. 1996, 'Pollution Tolerant Diatoms from lotic Systems in the Jacu' Basin, Rio Grande do Sul, Brasil', *Iheringia. Sér. Bot. Porto Alegre*, vol. 47, pp. 45–72.

- Lobo, E. A. & Kobayasi, H. 1990, 'Shannon's diversity index applied to some freshwater diatom assemblages in the Sakawa River System (Kanagawa Pref., Japan) and its use as an indicator of water quality', *Japanese Journal of Phycology*, vol. 38, pp. 229-243.
- Lowe, R. L. & Gale, W. F. 1980, 'Monitoring periphyton with artificial benthic substrates', *Hydrobiologia*, vol. 69, pp. 235-244.
- Lundholm, N., Daugbjerg, N. & Moestrup, O. 2002, 'Phylogeny of the Bacillariaceae with emphasis on the genus *Pseudo-nitzschia* (Bacillariophyceae) based on partial LSU rRNA'; *Eur. J. Phycol.*, vol. 37, pp. 115-134.
- Ludholm, N., Moestrup, O., Hasle, G. R. & Hoed-Emden, K. 2003, 'A study of the *Pseudo-nitzschia pseudodelicatissima/cuspidate* complex (Bacillariophyceae): what is *P. pseudodelicatissima?*', *J. Phycol.*, vol. 39, pp. 797-813.
- Lundholm, N., Moestrup, O., Kotaki, Y., Hoef-Emden, K., Scholin, C. & Miller, P. 2006, 'Inter- and intraspecific variation of the *Pseudo-nitzschia delicatissima* complex (Bacillariophyceae) illustrated by rRNA probes, morphological data and phylogenetic analyses', *J. Phycol.*, vol. 42, no. 2, pp. 464-481.
- Mann, D. G. 1999, 'The species concept in diatoms', *Phycologia*, vol. 38, pp. 437-495.
- Mann, D. G. 2000, 'Auxospore formation and neoteny in *Surirella angusta* (Bacillariophyta) and a modified terminology for cells of *Surirellaceae*', *Nova Hedwigia*, vol. 71, pp. 165-183.
- Mann, D. G. 2001, The systematics of the *Sellaphora pupula* complex: typification of *S. pupula*, Eds. Jahn, R., Kociolek, J. P., Witkowski, A. & Compe`re, P., *Lange-Bertalot-Festschrift. Studies on Diatoms, Dedicated to Prof. Dr. Dr. h.c. Horst Lange-Bertalot on the Occasion of His 65th Birthday*, A.R.G. Gantner, Ruggell, pp. 225-241.
- Mann, D. G. & Chepurnov, V. A. 2004, 'What have the Romans ever done for us? The past and future contribution for culture studies to diatom systematics', *Nova Hedwigia*, vol. 79, no. 1-2, pp. 237-291.
- Mann, D. G. & Droop, S. J. M. 1996, 'Biodiversity, biogeography and conservation of diatoms', *Hydrobiologia*, vol. 336, pp. 19-32.
- Mann, D. G., McDonald, S. M., Bayer, M., Droop, S. J. M., Chepurnov, V. A., Loke, R. E., Ciobanu, A. & Du Buf, H. J. M. 2004, 'The *Sellaphora pupula* species complex (Bacillariophyceae): morphometric analysis, ultrastructure and mating data provide evidence for five new species', *Phycologia*, vol. 43, no. 4, pp. 459-482.
- Marcus, M. D. 1980, 'Periphytic community response to chronic nutrient enrichment by a reservoir discharge', *Ecology*, vol. 61, no. 2, pp. 387-399.
- Markich, S. 1997, *Investigation of metal toxicity to tropical biota: recommendations for revision of the Australian water quality guidelines*, Eds. Markich, S & Camilleri, C. Supervising Scientist report 127, Supervising Scientist, Canberra, 94 pp.
- Mason, C. F. 1991, *Biology of Freshwater Pollution*, 2nd edition, Longman Scientific and Technical, Essex.
- Maznah, W. O. W. & Mashhor, M. 2002, 'Aquatic pollution assessment based on attached diatom communities in the Pinang River Basin, Malaysia', *Hydrobiologia*, vol. 487, pp. 229-241.

- McFarland, B. H., Hill, B. H. & Willingham, W. T. 1997, 'Abnormal *Fragilaria* spp. (Bacillariophyceae) in streams impacted by mine drainage', *J. Freshwater Ecology*, vol. 12, pp. 141-149.
- McGill, T. 2002, Mining in the northern Territory: Evolution of regulation, Eds. Markich, S. J. & Jeffree, R. A., *The Finnis River: A natural laboratory of mining impacts – past, present and future*, ANSTO, Sydney, Australia.
- McMahon, T. A., Finlayson, B. L., Haines, A. T. & Srikantha, R. 1991, *Global runoff: continental comparisons of annual flow and peak discharges*, Catena Verlag, Cremlingen, Germany.
- Medley, C. N. & Clements, W. H. 1998, 'Responses of diatom communities to heavy metals in streams: The influence of longitudinal variation', *Ecol. Appl.*, vol. 8, no. 3, pp. 631-644.
- Medlin, L. Elwood, H. J., Stickel, S. & Sogin, M. L. 1988, 'The characterization of enzymatically amplified eukaryotic 16S-like rRNA-coding regions', *Gene*, vol. 71, pp. 491-499.
- Medlin L. K., Elwood, H. J., Stickel, S. & Sogin, M. L. 1991, 'Morphological and genetic variation within the diatom *Skeletonema costatum* (Bacillariophyta): Evidence for a new species *Skeletonema pseudocostatum*', *Journal of Phycology*, vol. 27, pp. 514-524.
- Medlin, L. K., Kooistra, W. H. C. F., Gersonde, R. & Wellbrock, U. 1996, 'Evolution of the diatoms (Bacillariophyta). Molecular evidence for the origin of the Thalassiosirales', *Nova Hedwigia*, vol. 112, pp. 221-234.
- Medlin, L. K., Kooistra, W. H. C. F. & Schmid, A. M. M. 2000, 'A review of the evolution of the diatoms- a total approach using molecules, morphology and geology, Eds. Witkowski, A & Sieminska J., *The origin and early evolution of the diatoms: fossil, molecular and biogeographical approaches*, W. Szafer Institute of Botany, Polish Academy of Sciences, Cracow, pp. 13-35.
- Medlin, L. K., William, D. M., & Sims, P. A. 1993, 'The evolution of diatoms (Bacillariophyta) I. Origin of the group and assessment of the monophyly of its major divisions', *Eur. J. Phycol.*, vol. 28, pp. 261-275.
- Metzeltin, D & Lange-Bertalot, H. 1998, *Tropical Diatoms of South America I: About 700 predominantly rarely known or new taxa representative of the neotropical flora (Tropische Diatomeen in Südamerika I: 700 überwiegend wenig bekannte oder neue Taxa repräsentativ als Elemente der neotropischen Flora)*, Ed. Lange-Bertalot, H., *Iconographia Diatomologica*, volume 5, 695 pp.
- Meyer, J. L. 1997, 'Stream Health: Incorporating the Human Dimension to Advance Stream Ecology', *Journal of the North American Benthological Society*, vol. 16, no. 2, pp. 439-447.
- Michels, A. 1998, 'Effects of sewage water on diatoms (bacillariophyceae) and water quality in two tropical streams in Costa Rica', *A Rev. Biol. Trop.*, vol. 46, no. 6, pp. 153-175.
- Minerals and Energy Group. 2003, *Major Northern Territory Closed Mines 2003*, N.T. Dept. of Business, Industry and Resource Development.
- Moser, G. 1999, Die Diatomeen flora von Neukaledonien Systematik, Geobotanik, Ökologie. Ein Fazit (The diatom flora of New Caledonia. Systematics, geobotanical features and their ecology. A summary), *Bibliotheca Diatomologica*, Band 43, 205 pp.
- Moser, G., Lange-Betalot, H. & Metzeltin, D. 1998, Insel der Endemiten. Geobotanisches phänomen Neukaledonien, *Bibliotheca Diatomologica*, Band 38, 464 pp.

- Moser, G., Steindorf, A. & Lange-Bertalot, H. 1995, Neukaledonien Diatomeenflora einer Tropeninsel. Revision der Collection Maillard und Untersuchung neuen Materials (New Caledonia. The diatom flora of a tropical island. Revision of the Maillard collection and a study of new material), *Bibliotheca Diatomologica*, Band 32, 340 pp.
- Mutton, L. 2001, *A biological assessment of remediation measures on a tropical stream impacted by acid mine drainage*, The University of Adelaide, unpublished honours thesis.
- Muyzer, G. & Smalla, K. 1998, 'Application of denaturing gradient gel electrophoresis (DGGE) and temperature gradient gel electrophoresis (TGGE) in microbial ecology', *Antonie van Leeuwenhoek*, vol. 73, pp. 127-141.
- Nakanishi, Y., Sumita, M., Yumita, K., Yamada, T. & Honjo, T. 2004, 'Heavy-metal pollution and its state in algae in Kakehashi River and Godani River at the foot of Ogoya mine, Ishikawa prefecture', *Anal. Sci.*, vol. 20, no. 1, pp. 73-78.
- Nather Khan, I. S. A., 1991, 'Effect of urban and industrial wastes on species diversity of the diatom community in a tropical river, Malaysia', *Hydrobiologia*, vol. 224, pp. 175-184.
- Ndiritu, G. G., Gichuki, N. N., Kaur, P., Triest, L. 2003, 'Characterization of environmental gradients using physico-chemical measurements and diatom densities in Nairobi River, Kenya', *Aquatic Ecosystem Health & Management*, vol. 6, no. 3, pp. 343-354.
- New, T. R. 2000, *Conservation Biology: an introduction for Southern Australia*, Oxford University Press, Victoria.
- Newall, P., Bate, N. & Metzeling, L. 2006, 'A comparison of diatom and macroinvertebrate classification of sites in the Kiewa River system, Australia', *Hydrobiologia*, vol. 572, pp. 131-149.
- Noller, B. N., Parker, G. K. & Gao, G. H. 1997, Categorisation of acid drainage water from tropical mines (according to impact and treatment required), Eds. McLean, R. W. & Bells, L. C., *Proceedings of the Third Australian Workshop on Acid Mine Drainage, Darwin, Northern Territory*, Australian Centre for Mine site Rehabilitation Research: Brisbane, pp. 215-218.
- Norris, R. H. & Norris, K. R. 1995, 'The need for biological assessment of water quality: Australian perspective', *Australian Journal of Ecology*, vol. 20, pp. 1-6.
- Nylander, J. A., Ronquist, F., Huelsenbeck, J. P. & Nieves-Aldrey, J. L. 2004, 'Bayesian phylogenetic analysis of combined data', *Systematic Biology*, vol. 53, pp. 47-67.
- O'Connell, J. M., Reavie, E. D. & Smol, J. P. 1997, 'Assessment of water quality using epiphytic diatom assemblages on Cladophora from St. Lawrence river (Canada)', *Diatom Research*, vol. 12, no. 1, pp. 55-70.
- Orsini, L., Procaccini, G., Sarno, D. & Montresor, M. 2004, 'Multiple rDNA ITS-types within the diatom *Pseudo-nitzschia delicatissima* (Bacillariophyceae) and their relative abundances across a spring bloom in the Gulf of Naples', *Mar. Ecol. Prog. Ser.*, vol. 271, pp. 87-98.
- Orsini, L., Sarno, D., Procaccini, G., Poletti, R., Dahlmann, J. & Montresor, M. 2002, 'Toxic *Pseudo-nitzschia multistriata* (Bacillariophyceae) from the Gulf of Naples: morphology, toxin analysis and phylogenetic relationships with other *Pseudo-nitzschia* species', *Eur. J. Phycol.*, vol. 37, pp. 247-257.
- Palmer, M. A., Hakenkamp, C. C. & Nelson-Baker, K. 1997, 'Ecological Heterogeneity in Streams: Why Variance Matters', *Journal of the North American Benthological Society*, vol. 16, no. 1, pp. 189-202.

- Pan, Y., Stevenson, R. J., Hill, B. H., Herlihy, A. T. & Collins, G. B. 1996, 'Using Diatoms as Indicators of Ecological Conditions in Lotic Systems: A Regional Assessment', *Journal of the North American Benthological Society*, vol. 15, no. 4, pp. 481-495
- Pappas, J. L. & Stoermer, E. F. 2003, 'Legendre shape descriptors and shape group determination of specimens in the *Cymbella cistula* species complex'; *Phycologia*, vol. 42, pp. 90-7.
- Patrick, R. 1963, 'The structure of diatom communities under varying ecological conditions', *Ann. New York Acad. Sci.*, vol. 108, pp. 353-358.
- Patrick, R. 1974, Effects of abnormal temperatures on algal communities, Eds. Gibbons, J. W. & Sharitz, R. R., *Thermal Ecology*, ES Atomic Energy Commission, Washington D C, pp. 335-349.
- Patrick, S., Battarbee, R. W. & Jenkins, A. 1996, 'Monitoring acid waters in the UK: An overview of the UK acid waters monitoring network and summary of the first interpretative exercise', *Freshwater Biol.*, vol. 36, no. 1, pp. 131-150
- Patrick, R. & Reimer, C. W. 1966, The diatoms of the United States exclusive of Alaska and Hawaii, *Monographs of the Academy of Natural Sciences of Philadelphia*, vol. 1, 688 pp.
- Payle, R. C., Dixon, D. G. & Burnison, K. 1993, 'Copper and cadmium binding to fish gills: modification by dissolved organic carbon and synthetic ligands'; *Can. J. Fish. Aquat. Sci.*, vol. 50, pp. 2667-2677.
- Pearson, R. 2004, Aquatic ecosystem assets and threats to tropical, Eds. Gehrke, P., Bristow, K., Bunn, S., Douglas, M., Edgar, B., Finlayson, M., Hamilton, S., Loneragan, N., Lund, M., Pearson, R., Prosser, I. & Robson, C., *Sustainable Futures for Australia's Tropical rivers: The role of science in managing tropical rivers, wetlands, estuaries and coastal ecosystems*, Charles Darwin University, CSIRO tech report 17/04, 20 pp.
- Penna, A., Vila, M., Fraga, S., Giacobbe, M. G., Andreoni, F., Riobo, P. & Vernesi, C. 2005, 'Characterization of *Ostreopsis* and *Coolia* (*Dinophyceae*) isolates in the western Mediterranean Sea based on morphology, toxicity and internal transcribed spacer 5.8S rDNA sequences', *J. Phycol.*, vol. 41, pp. 212-25.
- Petersen, R. C., Madsen, B. L., Wilzbach, M. A., Madadza, C. H. D., Paarlberg, A., Kullberg, A. & Cummins, A. W. 1987, 'Stream management: emerging global similarities', *Ambio.*, vol. 16, pp. 166-179.
- Philibert, A., Gell, P. A., Newall, P., Bate, N. & Chessman, B. 2006, 'Development of diatom-based tools for assessing stream water quality in south-eastern Australia: assessment of environmental transfer functions', *Hydrobiologia*, vol. 572, no. 1, pp. 103-114.
- Philibert, A. & Prairie, Y. T. 1999, Diatom inferred paleolimnological reconstructions: do they work in nutrient rich lakes?, Eds. Veeman, T. S., Smith, D. W., Purdy, B. G., Salkie, F. J. & Larkin, G. A., *Proceedings of the 1999 Sustainable Forest Management Network Conference*, Edmonton, Alberta, Canada, pp. 155-160.
- Philibert, A. & Prairie, Y. T. 2002, 'Diatom-based transfer functions for western Quebec lakes (Abitibi and Haute Mauricie): The possible role of epilimnetic CO₂ concentration in influencing diatom assemblages', *Journal of Paleolimnology*, vol. 27, no. 4, pp. 465-480.
- Pickett-Heaps, J., Schmid, A-M. M. & Edgar, L. A., 1990, The cell biology of diatom valve formation, Eds. Round, F. E. & Chapman, D. J., *Progress in phycological research*, vol. 7, Biopress Ltd. Bristol, England, 168 pp.
- Pielou, E. C., 1975. *Ecological diversity*. John-Wiley & Sons, New York, 165 pp.

- Pienitz, R. & Smol, J. P. 1993, 'Diatom assemblages and their relationship to environmental variables in lakes from the boreal forest-tundra ecotone near Yellowknife, Northwest Territories, Canada', *Hydrobiologia*, vol. 269/270, pp. 391-404.
- Pienitz, R., Smol, J. P. & Birks, H. J. 1995, 'Assessment of freshwater diatoms as quantitative indicators of past climatic change in the Yukon and Northwest territories', *Canadian Journal of Paleolimnology*, vol. 13, pp. 21-49.
- Pienitz, R., Smol, J.P. & MacDonald, G. 1999, 'Paleolimnological reconstruction of the Holocene climatic trends from two boreal treeline lakes, Northwest Territories, Canada', *Arctic, Antarctic and Alpine Research*, vol. 31, pp. 82-93.
- Pipp, E. 2001, 'A regional diatom-based trophic state indication system for running water sites in Upper Austria and its regional applicability', *Verhandlungen der Internationalen Vereinigung für Theoretische und Angewandte Limnologie*, vol. 27, pp. 3376-3380.
- Planas, D. 1996, Acidification effects, Eds. Stevenson, R. J., Bothwell, M. L. & Lowe, R. L., *Algal Ecology: Freshwater Benthic Ecosystems*, Academic Press, London, pp. 497 – 532.
- Podani, J. 1992, Monitoring system. Ed. Kovacs, M., *Biological Indicators in Environmental Protection*, Ellis Horwood Series in Environmental Management, Science and Technology, pp. 12–18.
- Potapova, M. & Charles, D. 2002, 'Benthic diatoms in USA rivers: distributions along spatial and environmental gradients', *Journal of Biogeography*, vol. 29, pp. 67-187.
- Potapova, M. G., Charles, D. F., Ponader, K. C. & Winter, D. M. 2004, 'Quantifying species indicator values for trophic diatom indices: a comparison of approaches', *Hydrobiologia*, vol. 517, no. 1-3, pp. 25-41.
- Potapova, M. & Hamilton, P. B. 2007, 'Morphological and ecological variation within the *Achnantheidium minutissimum* (Bacillariophyceae) species complex', *J. Phycol.*, vol. 43, pp. 561–575.
- Potapova, M. & Snoeijs, P. 1997, 'The natural life cycle in wild populations of *Diatoma moniliformis* (Bacillariophyceae) and its disruption in an aberrant environment', *J. Phycol.*, vol. 33, pp. 924-937.
- Prygiel, J. 1991, Use of benthic diatoms in surveillance of the Artois-Picardie basin hydrobiological quality, Eds. Whitton, B. A., Rott, E. & Friedrich, G., *Use of Algae for Monitoring Rivers*, Institut für Botanik, Universität Innsbruck, pp. 89-96.
- Prygiel, J. & Coste, M. 1993, 'The assessment of water quality in the Artois-Picardie water basin (France) by the use of diatom indexes', *Hydrobiologia*, vol. 269, pp. 343-349.
- Prygiel, J., Whitton, B. A. & Bukowska, J. 1999, Use of Algae for monitoring rivers III., Eds. Prygiel, J., Whitton, B. A. & Bukowska, J., *Journal of Applied Phycology*, vol. 11, no. 6, pp. 596-597.
- Ramsey, D. L. & Brannon, D. G. 1988, 'Predicted acid mine drainage impacts on the Buckhannon River WV, USA', *Water Air and Soil Pollution*, vol. 39, pp. 1-14.
- Rapport, D. J. 1989, 'What constitutes ecosystem health?', *Perspectives in Biology and Medicine*, vol. 33, pp. 120-132.

- Raschke, R. L. 1993, 'Diatom (Bacillariophyta) community response to phosphorus in the Everglades National-Park, USA', *Phycologia*, vol. 32, no. 1, pp. 48-58.
- Redbank copper PTY LTD. 1992, *Sandyflat copper mine preliminary environmental report*. Redbank copper PTY LTD, WA.
- Reichardt, E. 1999, Zur Revision der Gattung Gomphonema. Die Arten um G.affine/insigne, G.angustatum/ micropus, G.acuminatum sowie gomphonemoide Diatomeen aus dem Oberoligozän in Böhmen, Ed. Lange-Bertalot, H., *Iconographia Diatomologica*, volume 8, 203 pp.
- Reid, M. A., Tibby, J. C., Penny, D. & Gell, P. A. 1995, 'The use of diatoms to asses past and present water quality', *Australian Journal of Ecology*, vol. 20, pp. 57-64.
- Resh, V. H., Brown, A. V., Covich, A. P., Gurtz, M. E., Li, H. W., Minshall, G. W., Reice, S. R., Sheldon, A. L., Wallace, J. B. & Wissmar, R. C. 1988, 'The role of disturbance in stream ecology', *Journal of the North American Benthological Society*, vol. 7, pp. 433-455.
- Resh, V. H., & Grodhaus, D. G. 1983, Aquatic insects in urban environments, Eds. Frankie, G. W. & Koehler, C. S., *Urban entomology*, Praeger Publishers, New York, pp. 247-276.
- Rhode, K. M., Pappas, J. L. & Stoermer, E. F. 2001, 'Quantitative analysis of shape variation in type and modern populations of Meridion (Bacillariophyceae)', *J. Phycol.*, vol. 37, pp. 175-83.
- Ronquist, F. & Huelsenbeck, J. P. 2003, 'MrBayes 3: Bayesian phylogenetic inference under mixed models', *Bioinformatics*, vol. 19, no. 12, pp. 1572-1574.
- Rosenberg, D. M. & Resh, V. H. 1993, Introduction to freshwater biomonitoring and benthic macroinvertebrates, Eds. Rosenberg, D. M. & Resh, V. H., *Freshwater Biomonitoring and Benthic Macroinvertebrates*, Chapman and Hall, New York & London, pp. 1-9.
- Rott, E. 1991, *Use of Algae for monitoring rivers*, Eds. Whitton, B. A., Rott, E., Friedrich, G., Universität Innsbruck, Austria, 193 pp.
- Rott, E. & Pfister, P. 1988, 'Natural epilithic algal communities in fast-flowing mountain streams and rivers and some man-induced changes', *Verh. Internat. Verein. Limnol.*, vol. 23, pp. 1320-1324.
- Round, F. E. 1991, 'Diatoms in river water-monitoring studies', *Journal of Applied Phycology*, vol. 3, pp. 129-145.
- Round, F. E. 1993, *A review and methods for the use of epilithic diatoms for detecting and monitoring changes in river water quality: Methods for the Examination of waters associated with materials*, HMSO, London, 65 pp.
- Round, F. E. 1996, 'What characters define diatom genera, species and infraspecific taxa?', *Diatom Research*, vol. 11, no. 1, pp. 203-218.
- Round, F. E., Crawford, R. M. & Mann, D. G. 1990, *The diatoms. Biology and morphology of the genera*. Cambridge University Press, Cambridge.
- Rumeau, A. & Coste, M. 1988, 'Initiation á la systématique des diatomées d'eau douce pour l'utilisation pratique d'un indice diatomique générique', *Bul. Fr. Pêche Piscic*, vol. 309, pp. 1-69.
- Ryner, T. A. & Armbrust, E. V. 2000, 'DNA fingerprinting reveals extensive genetic diversity in a field population of the centric diatom *Ditylum brightwellii*', *Limnol. Oceanogr*, vol. 45, pp. 1329-40.

- Sabater, S. 2000, 'Diatom communities as indicators of environmental stress in the Guadiamar River, S-W. Spain, following a major mine tailings spill', *J. Appl. Phycol.*, vol. 12, no. 2, pp. 113-124.
- Sabbe, K., Vanhoutte, K., Lowe, R. L., Bergey, E. A., Biggs, B. J. F., Francoer, S., Hodgson, D. & Vyverman, W. 2001, 'Six new *Actinella* (Bacillariophyta) species from Papua New Guinea, Australia and New Zealand: Further evidence for widespread diatom endemism in the Australasian region', *European Journal of Phycology*, vol. 36, pp. 321-340.
- Sabbe, K. & Vyverman, W. 1995, 'Taxonomy, morphology and ecology of some widespread representatives of the diatom genus *Opephora*', *European Journal of Phycology*, vol. 30, pp. 235-249.
- Salomoni, S. E., Rocha, O., Callegaro, V. L. M. & Lobo, E. A. 2006, 'Epilithic diatoms as indicators of water quality in Gravataí River, Rio Grande do Sul, Brazil', *Hydrobiologia*, vol. 559, no. 1, pp. 233-246.
- Sandin, L., Dahl, J. & Johnson, R.K. 2004, 'Assessing acid stress in Swedish boreal and alpine streams using benthic macroinvertebrates', *Hydrobiologia*, vol. 516, pp. 129-148.
- Sarno, D., Kooistra, W. H. C. F., Medlin, L. K., Percopo, I. & Zingone, A. 2005, 'Diversity in the genus *Skeletonema* (Bacillariophyceae). II. An assessment of the taxonomy of *S. costatum*-like species with the description of four new species', *J. Phycol.*, vol. 41, pp. 151-176.
- SAS Institute Inc. 2003, *JMP the statistical discovery software version 5.0.1*, SAS Institute Inc., Cary, NC.
- Schultz, T. J., Townsend, S. A., Edwards, C. A. & Dostine, P. L. 2002, *Water quality monitoring in the Mary River catchment*, Tech. Report 42/2002, Department of Infrastructure, Planning and Environment, Darwin, NT.
- Scrimgeour, G. J. & Wicklum, D. 1996, 'Aquatic Ecosystem Health and Integrity: Problems and Potential Solutions', *Journal of the North American Benthological Society*, vol. 15, no. 2., pp. 254-261.
- Silva-Benavides, A. 1996, 'The epilithic diatom flora of a pristine and a polluted river in Costa Rica, Central America', *Diatom Research*, vol. 11, no. 1, pp. 105-142.
- Sincock, A., Gell, P. A. & Ferris, J. 1999, *Scientists Call For Dawesley Creek Clean-Up*, Media Release, 24th November 1999, available URL:<<http://www.ansto.gov.au/>
- Sirocco Resources N.L. 1998, *Prefeasibility study; recommencement of operation at Tom's Gully mine and nearby prospects*, SIROCCO Resources N.L.
- Sirocco Resources N.L. 1999, *Quest 29 Project N.T.; PER commencement of mining and processing operations at quest 29 mining leases and Tom's gully*, Sirocco Resources N.L.
- Sladěček, V. 1973, 'System of water quality from the biological point of view', *Archiv für Hyrdobiologie Beiheft*, vol. 7, pp. 1-218.
- Smith, D. I. 1998, *Water in Australia – Resources and Management*. Oxford University Press, New York.
- Smol, J. P. & Cumming, B. F. 2000, 'Tracking long-term changes in climate using algal indicators in lake sediments', *J. Phycol.*, vol. 36, no. 6, pp. 986-1011.

- Smol, J.P., Cumming, B.F., Dixit, A.S. & Dixit, S.S. 1998, 'Tracking recovery patterns in acidified lakes: A paleolimnological perspective', *Restoration Ecology*, vol. 6, pp. 318-326.
- Smol, J. P. & Douglas, M. S. V. 1996, 'Long-term environmental monitoring in arctic lakes and ponds using diatoms and other biological indicators', *Geosci. Can.*, vol. 23, no. 4, pp. 225-230.
- Snoeijs, P. & Potapova, M. 1998, 'Ecotypes or endemic species? – a hypothesis on the evolution of Diatoma taxa (Bacillariophyta) in the northern Baltic Sea', *Nova Hedwigia*, vol. 67, pp. 303-348.
- Sonneman, J., Sincock, A., Fluin, J., Reid, M., Newall, P., Tibby, J. & Gell, P.A. 2000, *An Illustrated Guide to Common Stream Diatom Species from Temperate Australia*, The Murray-Darling Freshwater Research Centre, Identification Guide No. 33, 166 pp.
- Sonneman, J. A., Walsh, C. J., Breen, P. F., & Sharpe, A. K. 2001, 'Effects of urbanization on streams of the Melbourne region, Victoria, Australia. II. Benthic diatom communities', *Freshwater Biol.*, vol. 46, no. 4, pp. 553-565.
- Sorhannus, U., Gasse, F., Perasso, R. & Baroin-Tourancheau, A. 1995, 'A preliminary phylogeny of diatoms based on 28s ribosomal RNA sequence data', *Phycologia*, vol. 34, pp. 65-73.
- Soudek, D. Jr. & Robinson, G. G. C. 1983, 'Electrophoretic analysis of the species and population structure of the diatom *Asterionella Formosa*', *Can. J. Bot.*, vol. 61, pp. 418-433.
- Stabile, J. E., Wurtzel, E. T. & Gallagher, J. C. 1992, 'Comparison of chloroplast DNA and allozyme variation in winter strains of the marine diatom *skeletonema costatum* (Bacillariophyta)', *J. Phycol.*, vol. 28, pp. 90-94.
- Stauber, J. L., Ahsanullah, M., Nowak, B. & Florence, T. M. 1996, *Toxicity assessment of waters from Macquarie Harbour, Western Tasmania, using algae, invertebrates and fish*, Mount Lyell Remediation Research and Demonstration Program, 91 pp.
- Steedman, R. J. 1994, 'Ecosystem health as a management goal', *Journal of the North American Benthological Society*, vol. 13, pp. 605-610.
- Stevenson, R. J. 1984, 'Epilithic and epipellic diatoms in the Sandusky River, with emphasis on species diversity and water pollution', *Hydrobiologia*, vol. 114, pp. 161-175.
- Stevenson, A. C., Juggins, S., Birks, H. J. B., Anderson, D. S., Anderson, N. J., Battarbee, R. W., Berge, E., Davis, R. B., Flower, R. J., Haworth, E. Y., Jones, V. J., Kingston, J. C., Kreiser, A. M., Line, J. M., Munro, M. A. R. & Renberg, I. 1991, *The Surface Water Acidification Project Palaeolimnology Programme: Modern Diatom/Lake-Water Chemistry Data-set*, ENSIS Publishing, London, 86 pp.
- Stevenson, R. J. & Pan, Y. 1999, Assessing environmental conditions in rivers and streams with diatoms, Eds. Stoermer, F. & Smol, J. P., *The Diatoms: Applications for the Environmental and Earth Sciences*, Cambridge University Press, Cambridge, pp. 11-40.
- Stewart, P. M., Butcher, J. T. & Gerovac, P. J. 1999, 'Diatom (*Bacillariophyta*) community response to water quality and land use', *Nat. Areas J.*, vol. 19, pp. 155-165.
- Stoermer, E. F. & Håkansson, H. 1984, '*Stephanodiscus parvus*: validation of an enigmatic and widely misconstrued taxon', *Nova Hedwigia*, vol. 39, pp. 497-511.
- Stoermer, E. F. & Smol, J. P. 1999, *The Diatoms: Applications for the Environmental and Earth Sciences*. Cambridge University Press, Cambridge, UK.

- Sudhakar, G., Jypthi, B. & Venkateswarlu, V. 1994, 'Role of diatoms as indicators of pollution gradients', *Env. Mon. & Ass.*, vol. 33, no. 2, pp. 85-99.
- Sullivan, C. W. 1986, 'Silification by diatoms', *Ciba. F. Symp.*, vol. 121, pp. 59-89.
- Sunda, W. & Guillard, R. R. L. 1976, 'The relationship between cupric ion activity and toxicity of copper to phytoplankton', *J. Mar. Res.*, vol. 34, pp. 511-529.
- Syversten, E. E. 1977, '*Thalassiosira rotula* and *T. gravida*: ecology and morphology', *Nova Hedwigia, Beih.*, vol. 54, pp. 99-112.
- Taylor, F. B. 1929, *Notes on diatoms*. Bournemouth, published privately, 269 pp.
- Tent, L. 1981, 'The aufwuchs in Hamburg West Germany harbour the structure of a highly stressed biotic community in the Elbe estuary', *Archiv fuer Hydrobiologie, Supplement*, vol. 61, no. 1-2, pp. 1-58.
- ter Braak, C.J.F. 1985, 'Correspondence analysis of incidence and abundance data: properties in terms of a unimodal response model', *Biometrics*, vol. 41, pp. 859-873.
- ter Braak, C. J. F. 1987, Ordination, Eds. Jongman, R. H. G., terBraak, C. J. F. & van Tongeren, O. F. R., *Data Analysis in Community and Landscape Ecology*. Pudoc, Wageningen, pp. 91-173.
- ter Braak, C. J. F. 1988, 'CANOCO—an extension of DECORANA to analyze species-environment relationships', *Plant Ecology*, vol. 75, no. 3, pp. 159-160.
- ter Braak, C. J. E, 1990, *Update notes: CANOCO version 3.1*. Agricultural Mathematics Group, Wageningen, 35 pp.
- ter Braak, C. J. E & Juggins, S. 1993, 'Weighted averaging partial least squares regression (WAPLS): an improved method for reconstructing environmental variables from species assemblages', *Hydrobiologia*, vol. 269, pp. 485- 502.
- ter Braak, C. J. F. & Looman, C. W. N. 1995, Regression, Eds. Jognman, R: H. G., ter Braak. C. J. F. & van Tongerer, O. F. R., *Data analysis in community and landscape ecology*, Cambridge University Press, Cambridge, pp. 29-77.
- ter Braak, C. J. F. & Prentice, I. C. 1988, 'A theory of gradient analysis', *Adv. Ecol. Res.*, vol. 18, pp. 271-317.
- Ter Braak, C. J. F. & Šmilauer, P. 1998, *CANOCO: Reference manual and user's guide to Canoco for Windows: software for Canonical Community Ordination (Version 4)*, Microcomputer Power, Ithaca, New York.
- ter Braak, C. J. F. & van Dam, H. 1989, 'Inferring pH from diatoms: a comparison of old and new calibration methods', *Hydrobiologia*, vol. 178, pp. 209-223.
- Theriot, E. 1992, 'Clusters, species concepts, and morphological evolution of diatoms', *Syst. Biol.*, vol. 41, pp. 141-157.
- Thomas, D. P. 1983, *A limnological survey of the Alligator Rivers Region. Volume I Diatoms (Bacillariophyceae) of the Region*, Research report 3(i), Supervising Scientist for the Alligator Rivers Region, AGPS, Canberra.
- Thomas, D. P. 1987, 'New freshwater diatom taxa from tropical northern Australia', *Trans. R. Soc. S. Aust.*, vol. 111, no. 1, pp. 53-58.

- Thompson, J. D., Gibson, T. J., Plewniak, F., Jeanmougin, F. & Higgins, D. G. 1999, 'The ClustalX windows interface: flexible strategies for multiple sequence alignment aided by quality analysis tools', *Nucleic Acids Research*, vol. 25, pp. 4876-4882.
- Tibby, J. 2000. *The development of a diatom-based model for inferring lake water total phosphorus and its application to Burrinjuck Reservoir, southern NSW*. Unpublished Ph.D. thesis.
- Tibby, J. 2004, 'Development of a diatom-based model for inferring total phosphorus in southeastern Australian water storages', *Earth and Environmental Science*, vol. 31, no. 1, pp. 23-36.
- Tibby, J., Reid, M., Fluin, J., Hart, B.T. & Kershaw, A. P. 2003, 'Assessing long-term pH change in an Australian river catchment using monitoring and palaeolimnological data', *Environmental Science and Technology*, vol. 37, no. 15, pp. 3250-3255.
- Townsend, S., Gell, P., Bickford, S., Tibby, J., Croome, R., Przyylska, M., Padovan, A. & Metcalfe, R. 2002. *Periphyton and phytoplankton response to reduced dry season flows in the Daly River*, Final Milestone Report for Project ID 22963, NT Department of Infrastructure Planning and Environment, Darwin.
- Townsend, S. 2001, Management issues for the inland river of the Northern Territory, Eds. Webster, R. & Williams, M. & Associates Pty Ltd., *Report of the Inland River Workshop*, Land and Water Australia.
- Townsend, S. 2003, Australia-wide assessment of river health: Northern Territory status report and commentary (2001), *Monitoring river health initiative*, report number 8b, Department of the Environment and Heritage.
- Townsend, S. A. & Gell, P. A. 2005, 'The role of substrate type on benthic diatom assemblages in the Daly & Roper Rivers of the Australian wet/dry tropics', *Hydrobiologia*, vol. 548, pp. 101-115.
- Townsend, C. R. & Riley, R. H. 1999, 'Assessment of river health: accounting for perturbation pathways in physical and ecological space', *Freshwater Biology*, vol. 41, pp. 393-405.
- Trobajo, R., Cox, E. J., Quintana, X. D. 2004, 'The effects of some environmental variables on the morphology of *Nitzschia frustulum* (Bacillariophyta), in relation its use as a bioindicator', *Nova Hedwigia*, vol. 79, no. 3/4, pp. 433-445.
- Trobajo, R., Mann, D. G., Chepurnov, V. A., Clavero, E. & Cox, E. J. 2006, 'Taxonomy, life cycle, and auxospore formation of *Nitzschia fonticola* (Bacillariophyta)', *Journal of Phycology*, vol. 42, no. 6, pp. 1353-1372.
- Twining, J. R. 2002a, Ecological risk assessment of the east branch, Finnis River, Eds. Markich, S. J. & Jeffree, R. A., *The Finnis River: a natural laboratory of mining impacts—past, present and future*, The Finnis River Symposium, Darwin, August 2001, Australian Nuclear Science and Technology Organisation, Sydney.
- Twining, J. R. 2002b, Post-remedial ecological recovery in the East Branch of the Finnis River: fish and decapods, Eds. Markich, S. J. & Jeffree, R. A., *The Finnis River: a natural laboratory of mining impacts—past, present and future*, The Finnis River Symposium, Darwin, August 2001, Australian Nuclear Science and Technology Organisation, Sydney.
- Twining, J. R., Perera, J., Nyugen, V., Brown, P. L., & Ellis, B. 1999, *AQUARISK. A computer code for ecological risk assessment*, ANSTO/M127, Australian Nuclear Science and Technology Organisation, Sydney.
- Tyler, P. A. 1992, 'A lake land from the ocean time. The second founder lecture', *Br. Phycol. J.*, vol. 27, pp. 353-386.

- Tyler, P. A. 1996, 'Endemism in freshwater algae, with special reference to the Australian region', *Hydrobiologia*, vol. 336, pp. 127-135.
- Tyler, P. A. 1998, Endemicity in Australian diatoms, Ed. Newall, P., *Proceedings of the First Australian Diatom workshop*, Deakin University, Warrnambool, Australia, Technical paper 1998/1, School of Ecology and Environment, Deakin University, Australia, pp. 22-23.
- Tyler, P. A. & Wickham, R. 1988, 'Yan Yean revisited – a bicentennial window on Australian freshwater phycology', *Br. Phycol J.*, vol. 23, pp. 105-114.
- Underwood, A. J. 1994, 'On beyond BACI – sampling designs that might reliably detect environmental disturbances', *Ecological Applications*, vol. 4, no. 1. pp. 3-15.
- van Dam, H. 1982, 'On the use of measures of structure and diversity in applied diatom ecology', *Nova Hedwigia*, vol. 73, pp. 97–115.
- van Dam, H. & Mertens, A. 1990, 'A comparison of recent epilithic diatom assemblages from the industrially acidified and copper polluted lake orta (Northern Italy) with old literature data', *Diatom Research*, vol. 5, no. 1, pp. 1-13.
- van Dam, H. & Mertens, A. 1995, 'Long-term changes of diatoms and chemistry in headwater streams polluted by atmospheric deposition of sulphur and nitrogen compounds', *Freshwater Biology*, vol. 34, no. 3, pp. 579–600.
- van Dam, H., Mertens, A. & Sinkeldam, J. 1994, 'A coded checklist and ecological indicator values of freshwater diatoms from the Netherlands', *Netherlands Journal of Aquatic Ecology*, vol. 28, no. 1, pp. 1117-133.
- van der Auwera, G. & de Wachter, R. 1998, 'Structure of the large subunit rDNA from a diatom, and comparison between small and large subunit ribosomal RNA for studying Stramenopile evolution', *J. Eukaryote. Microbiol.*, vol. 45, pp. 521–7.
- Verb, R. G. & Vis, M. L. 2000, 'Comparison of benthic diatom assemblages from streams draining abandoned and reclaimed coal mines and nonimpacted sites', *J. N. Am. Benthol. Soc.*, vol. 19, pp. 274–288.
- Vyverman, W. & Sabbe, K. 1995a, 'Diatom-temperature transfer-functions based on the altitudinal zonation of diatom assemblages in Papua-New-Guinea - A possible tool in the reconstruction of regional paleoclimatic changes', *J. Paleolimnol.*, vol. 13, no. 1, pp. 65-77.
- Vyverman, W., Sabbe, K., Mann, D. G., Kilroy, C., Vyverman, R., van Houtte, K. & Hodgson, D. 1998, '*Eunophora* gen. nov. (Bacillariophyta) from Tasmania and New Zealand: description and comparison with *Eunotia* and amphosoid diatoms', *European Journal of Phycology*, vol. 33, pp. 95-111.
- Vyverman, W., Sabbe, K. & Vyverman, R. 1997, 'Five new freshwater species of *Biremis* (Bacillariophyta) from Tasmania', *Phycologia*, vol. 36, pp. 91-102.
- Vyverman, W., Vyverman, R., Hodgson, D. & Tyler, P. A. 1995b, Diatoms from Tasmanian mountain lakes: a reference data set (TASDIAT) for environmental reconstruction and a systematic autecological study, *Bibliotheca Diatomologica*, vol. 33, 193 pp.
- Vyverman, W., Vyverman, R., Tyler, P.A. & Rajendran, V.S. 1996, 'Distribution of benthic diatom assemblages in Tasmanian highland lakes and their possible use as indicators of environmental changes', *Can. J. Fish. Aquat. Sci.*, vol. 53, pp. 493-508.

- Walker, C. E. & Pan, Y. D. 2006, 'Using Diatom Assemblages to Assess Urban Stream Conditions', *Hydrobiologia*, vol. 561, no. 1, pp. 179-189.
- Watanabe T., Asai, K & Houki, A. 1986, 'Numerical estimation to organic pollution of flowing water by using the epilithic diatom assemblage – Diatom Assemblage Index (DAIPO)', *Sci. Total Environ.*, vol. 55, pp. 209-218.
- Watanabe T., Asai, K & Houki, A. 1988, Numerical Water Quality Monitoring of Organic Pollution using Diatom Assemblages, Ed. Round, F. E., *Proceedings of the Ninth International Diatom Symposium*, Bristol, Biopress, Bristol & Koeltz, Koenigstein, pp. 123-141.
- Ward, J. V. 1998, 'Riverine landscapes: biodiversity patterns, disturbance regimes, and aquatic conservation', *Biological Conservation*, vol. 83, pp. 269–278.
- Whitton, B. A. & Diaz, B. M. 1981, 'Influence of environmental factors on photosynthetic species composition in highly acidic waters', *Verhandlungen der Internationale Vereinigung für theoretische und angewandte Limnologie*, vol. 21, pp. 1459-1465.
- Whitton, B. A. & Kelly, M. G. 1995, 'Use of algae and other plants for monitoring rivers', *Aust. J. Ecol.*, vol. 20, no. 1, pp. 45-56.
- William, H. T., Hollibaugh, J. T. & Seibert, D. L. R. 1980, 'Effects of heavy metals on the morphology of some marine phytoplankton', *Phycologia*, vol. 19, no. 3, pp. 202–209.
- Williams, D. M. 1994, Diatom biogeography: some preliminary considerations, Eds. Marino, D. & Montresor, M., *Proceedings of the 13th International Diatom Symposium*, Biopress Ltd, Bristol, pp. 311-319.
- Winner, R. W., Boesel, M. W. & Farret, M. P. 1980, 'Insect community structure as an index of heavy metal pollution in lotic ecosystems', *Canadian Journal of Fisheries and Aquatic Science*, vol. 37, pp. 647–655.
- Winner, R.W., Van Dyke, J.S., Caris, N. & Farrel, M. 1975, 'Response of the macroinvertebrate fauna to a copper gradient in an experimentally-polluted stream', *Verhandlungen der Internationalen Vereinigung für Limnologie*, vol. 19, pp. 2121–2127.
- Winter, J. G., Duthie, H. C. 2000, 'Stream biomonitoring at an agricultural test site using benthic algae', *Can. J. Bot.*, vol. 78, no. 10, pp. 1319-1325.
- Witkowski, A., Lange-Bertalot, H., Kociolek, J.P., Ruppel, M., Wawrzyniak-Wydrowska, B., Bak, M. & Brzezinska, A. 2004, 'Four new species of *Nitzschia* sect. *Tryblionella* (Bacillariophyceae) resembling *N. parvula*', *Phycologia*, vol. 43, pp. 579-595.
- Wood, A. M. & Leatham, T. 1992, 'The species concept in phytoplankton ecology Journal', *Journal of Phycology*, vol. 28, pp. 723-729.
- Wright, J. F. 1995, 'Development and use of a system for predicting the macroinvertebrate fauna in flowing waters', *Australian Journal of Ecology*, vol. 20, pp. 181-197.
- Wu, J. T. 1999, 'A generic index of diatom assemblages as bioindicator of pollution in the Keelung River of Taiwan', *Hydrobiologia*, vol. 397, pp. 79-87.
- Wunsam, S., Cattaneo, A. & Bourassa, N. 2002, 'Comparing diatom species, genera and size in biomonitoring: a case study from streams in the Laurentians (Quebec, Canada)', *Freshwater Biology*, vol. 47, pp. 325–340.

Yang, J. R. & Duthie, H. C. 1993, 'Morphology and ultrastructure of teratological forms of the diatoms *Stephanodiscus niagarae* and *S. parvus* (Bacillariophyceae) from Hamilton Harbour (Lake Ontario, Canada)', *Hydrobiologia*, vol. 269, pp. 57-66.

Zechman, F.W., Zimmer, E. A. & Theriot, E. C. 1994, 'Use of ribosomal DNA internal transcribed spacers for phylogenetic studies in diatoms', *J. Phycol.*, vol. 30, pp. 507-512.