

SUPPLEMENTARY MATERIAL

On the ability of proglacial lake diatoms to reconstruct Antarctic past ozone changes

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Table 1: Spearman correlation between the relative abundance of the most abundant diatoms set and the environmental data. Blue and gray boxes corresponds to ρ and p values, respectively. Values in bold are those that present significant statistical correlations.

	<i>Achnantheidium cf. maritimo-antarcticum</i>	<i>Aulacoseira glubokoyensis</i>	<i>Brachysira minor</i>	<i>Diatomella balfouriana</i>	<i>Eunotia ralitsae</i>	<i>Fragilaria cf. capuccina</i>	<i>Gomphonema maritimo-antarcticum</i>	<i>Gomphonema sp.</i>
<i>Achnantheidium cf. maritimo-antarcticum</i>		0.1364	0.0187	0.4805	0.8007	0.4318	0.1362	0.4741
<i>Aulacoseira glubokoyensis</i>	-0.44		0.0024	0.9007	0.3058	0.0205	0.0010	0.1785
<i>Brachysira minor</i>	0.64	-0.76		0.7208	0.4094	0.3538	0.1058	0.7907
<i>Diatomella balfouriana</i>	-0.22	-0.04	-0.11		0.1611	0.8725	0.4577	0.2213
<i>Eunotia ralitsae</i>	-0.08	0.31	-0.25	-0.41		0.2792	0.7058	0.3525
<i>Fragilaria cf. capuccina</i>	0.24	-0.63	0.28	0.05	-0.32		0.0175	0.0732
<i>Gomphonema maritimo-antarcticum</i>	0.44	-0.80	0.47	-0.23	-0.12	0.64		0.1832
<i>Gomphonema sp.</i>	0.22	-0.40	0.08	0.36	-0.28	0.51	0.39	
<i>Humidophila sp.</i>	0.23	-0.62	0.71	0.22	-0.24	0.19	0.28	0.06
<i>Humidophila tabellariaeformis</i>	-0.36	-0.12	-0.05	0.05	0.31	-0.01	0.02	-0.36
<i>Melosira cf. varians</i>	-0.12	-0.27	0.05	0.71	-0.39	0.11	0.18	0.14
<i>Nitzschia cf. kleinteichiana</i>	0.27	-0.48	0.09	-0.30	-0.17	0.65	0.71	0.61
<i>Pinnularia borealis</i>	0.44	-0.38	0.07	-0.16	0.03	0.58	0.60	0.66
<i>Pinnularia cf. australomicrostauron</i>	0.36	0.06	0.06	-0.46	0.17	-0.26	0.23	0.04
<i>Pinnularia sp.</i>	0.24	-0.52	0.77	0.03	-0.14	0.16	0.21	-0.23
<i>Planothidium australe</i>	0.49	-0.67	0.55	0.01	-0.35	0.59	0.59	0.43
<i>Psammothidium abundans</i>	0.29	-0.74	0.56	-0.26	-0.04	0.70	0.62	0.41
<i>Planathidium rostrulanceolatum</i>	0.11	-0.38	0.23	-0.15	-0.27	0.09	0.24	0.08
<i>Stauroneis cf. delicata</i>	0.03	0.16	-0.13	0.64	-0.43	-0.13	-0.20	0.18
October Ozone in Faraday Station (DU)	0.39	-0.18	-0.04	0.04	-0.37	0.35	0.38	0.73
Summer cyclone energy (DP)	-0.27	0.10	0.07	0.03	0.14	-0.34	-0.28	-0.73
Air Temperature (°C)*	-0.22	0.39	0.03	0.09	0.32	-0.80	-0.56	-0.65
AAO	-0.27	0.24	0.15	0.05	0.00	-0.62	-0.56	-0.73
Total Cloud Cover	-0.19	-0.01	-0.24	-0.31	-0.65	0.14	0.20	0.00
Winter Snowfall (kg.m-2.s-1)	-0.21	0.05	-0.38	0.43	0.26	0.13	-0.20	0.00
Annual Wind Speed (Knots)	-0.46	0.15	-0.38	0.41	-0.01	-0.05	-0.29	0.23
Summer Wind Speed (Knots)	-0.03	-0.11	0.11	0.04	0.06	-0.17	-0.09	-0.17
Fall Wind Speed (Knots)	-0.44	0.30	-0.25	0.10	-0.26	-0.25	-0.40	-0.02
Winter Wind Speed (Knots)	-0.27	0.59	-0.53	-0.06	0.40	-0.49	-0.60	-0.03
Spring Wind Speed (Knots)	-0.53	-0.19	-0.21	0.77	-0.25	0.27	0.01	0.30

	<i>Humidophila</i> sp.	<i>Humidophila tabellariaeformis</i>	<i>Melosira</i> cf. <i>varians</i>	<i>Nitzschia</i> cf. <i>kleinteichiana</i>	<i>Pinnularia borealis</i>	<i>Pinnularia</i> cf. <i>australomicrostauron</i>	<i>Pinnularia</i> sp.	<i>Planothidium australe</i>
<i>Achnantheidium</i> cf. <i>maritimo-antarcticum</i>	0.4411	0.2292	0.6973	0.3636	0.1309	0.2230	0.4200	0.0918
<i>Aulacoseira glubokoyensis</i>	0.0226	0.6941	0.3792	0.0985	0.1974	0.8509	0.0707	0.0115
<i>Brachysira minor</i>	0.0069	0.8725	0.8658	0.7615	0.8311	0.8439	0.0021	0.0502
<i>Diatomella balfouriana</i>	0.4681	0.8585	0.0067	0.3156	0.5986	0.1156	0.9149	0.9714
<i>Eunotia ralitsae</i>	0.4283	0.3012	0.1844	0.5837	0.9227	0.5696	0.6541	0.2472
<i>Fragilaria</i> cf. <i>capuccina</i>	0.5388	0.9716	0.7277	0.0165	0.0380	0.3923	0.5905	0.0355
<i>Gomphonema</i> <i>maritimo-antarcticum</i>	0.3569	0.9416	0.5660	0.0063	0.0294	0.4558	0.4810	0.0356
<i>Gomphonema</i> sp.	0.8367	0.2264	0.6554	0.0283	0.0144	0.8941	0.4565	0.1429
<i>Humidophila</i> sp.		0.2438	0.0900	0.8718	0.4057	0.2458	0.0003	0.2657
<i>Humidophila tabellariaeformis</i>	0.35		0.5383	0.3839	0.0687	0.0492	0.1876	0.1987
<i>Melosira</i> cf. <i>varians</i>	0.49	0.19		0.8143	0.5648	0.1394	0.3177	0.7262
<i>Nitzschia</i> cf. <i>kleinteichiana</i>	0.05	-0.26	-0.07		0.0018	0.3323	0.4821	0.0377
<i>Pinnularia borealis</i>	-0.25	-0.52	-0.18	0.78		0.1069	0.1551	0.0193
<i>Pinnularia</i> cf. <i>australomicrostauron</i>	-0.35	-0.55	-0.43	0.29	0.47		0.1568	0.3107
<i>Pinnularia</i> sp.	0.84	0.39	0.30	-0.21	-0.42	-0.42		0.7329
<i>Planothidium australe</i>	0.33	-0.38	0.11	0.58	0.64	0.31	0.10	
<i>Psammothidium abundans</i>	0.48	0.15	-0.21	0.65	0.45	0.00	0.34	0.63
<i>Planathidium rostr lanceolatum</i>	-0.08	-0.42	-0.01	0.24	0.36	0.22	-0.13	0.36
<i>Stauroneis</i> cf. <i>delicata</i>	0.29	-0.14	0.67	-0.07	-0.17	-0.13	-0.02	0.15
October Ozone in Faraday Station (DU)	-0.36	-0.75	-0.08	0.64	0.80	0.50	-0.55	0.46
Summer cyclone energy (DP)	0.29	0.76	0.11	-0.64	-0.78	-0.34	0.43	-0.32
Air Temperature (°C)*	0.04	0.18	0.06	-0.90	-0.70	-0.02	0.26	-0.49
AAO	0.26	0.31	-0.02	-0.74	-0.79	-0.07	0.36	-0.26
Total Cloud Cover	-0.29	-0.16	-0.23	0.36	0.02	0.07	-0.30	-0.21
Winter Snowfall (kg.m-2.s-1)	-0.03	0.55	0.11	-0.12	-0.20	-0.36	-0.21	-0.07
Annual Wind Speed (Knots)	-0.19	0.02	0.28	-0.22	-0.04	-0.57	-0.18	-0.35
Summer Wind Speed (Knots)	0.38	0.34	0.28	-0.20	-0.37	-0.62	0.41	-0.42
Fall Wind Speed (Knots)	-0.22	-0.33	0.06	-0.18	-0.16	-0.23	-0.19	-0.16
Winter Wind Speed (Knots)	-0.51	-0.13	-0.31	-0.27	-0.09	-0.12	-0.48	-0.48
Spring Wind Speed (Knots)	0.13	0.43	0.66	-0.23	-0.16	-0.74	0.09	-0.19

	<i>Psammothidium abundans</i>	<i>Planathidium rostromanceolatum</i>	<i>Stauroneis</i> cf. <i>delicata</i>	October Ozone in Faraday Station (DU)	Summer cyclone energy (DP)	Air Temperature (°C)*	AAO	Total Cloud Cover
<i>Achnanthyidium</i> cf. <i>maritimo-antarcticum</i>	0.3311	0.7266	0.9223	0.1826	0.3636	0.4805	0.3732	0.5968
<i>Aulacoseira</i> <i>glubokoyensis</i>	0.0036	0.2014	0.6069	0.5656	0.7479	0.1876	0.4358	0.9867
<i>Brachysira</i> <i>minor</i>	0.0486	0.4481	0.6787	0.8866	0.8166	0.9149	0.6148	0.5109
<i>Diatomella</i> <i>balfouriana</i>	0.3884	0.6158	0.0180	0.8866	0.9149	0.7615	0.8652	0.3848
<i>Eunotia</i> <i>ralitsae</i>	0.9005	0.3731	0.1389	0.2115	0.6411	0.2879	0.9893	0.0425
<i>Fragilaria</i> cf. <i>capuccina</i>	0.0075	0.7752	0.6787	0.2466	0.2629	0.0011	0.0247	0.7009
<i>Gomphonema</i> <i>maritimo-antarcticum</i>	0.0247	0.4349	0.5080	0.2020	0.3597	0.0468	0.0474	0.5788
<i>Gomphonema</i> sp.	0.1607	0.8000	0.5572	0.0044	0.0044	0.0161	0.0049	0.0000
<i>Humidophila</i> sp.	0.1003	0.7878	0.3281	0.2282	0.3412	0.9002	0.3902	0.4191
<i>Humidophila</i> <i>tabellariaeformis</i>	0.6346	0.1557	0.6392	0.0030	0.0027	0.5656	0.3096	0.6515
<i>Melosira</i> cf. <i>varians</i>	0.4970	0.9626	0.0119	0.7852	0.7206	0.8437	0.9587	0.5296
<i>Nitzschia</i> cf. <i>kleinteichiana</i>	0.0157	0.4262	0.8224	0.0178	0.0191	0.0000	0.0042	0.3104
<i>Pinnularia</i> <i>borealis</i>	0.1186	0.2292	0.5823	0.0010	0.0016	0.0079	0.0014	0.9511
<i>Pinnularia</i> cf. <i>australomicrostauron</i>	0.9964	0.4631	0.6708	0.0843	0.2486	0.9358	0.8259	0.8413
<i>Pinnularia</i> sp.	0.2500	0.6808	0.9428	0.0518	0.1383	0.3943	0.2257	0.4047
<i>Planothidium</i> <i>australe</i>	0.0223	0.2282	0.6308	0.1150	0.2858	0.0921	0.3955	0.5513
<i>Psammothidium</i> <i>abundans</i>		0.7956	0.2800	0.7070	0.6089	0.0284	0.3444	0.9203
<i>Planathidium</i> <i>rostromanceolatum</i>	0.08		0.2939	0.2233	0.2086	0.8028	0.7953	0.3282
<i>Stauroneis</i> cf. <i>delicata</i>	-0.32	-0.32		0.7122	0.9499	0.9857	0.8219	0.5891
October Ozone in Faraday Station (DU)	0.12	0.36	0.11		0.0002	0.0205	0.0068	0.1076
Summer cyclone energy (DP)	-0.16	-0.37	0.02	-0.86		0.0463	0.0023	0.6032
Air Temperature (°C)*	-0.61	-0.08	-0.01	-0.63	0.56		0.0024	0.1276
AAO	-0.29	-0.08	0.07	-0.71	0.77	0.76		0.5551
Total Cloud Cover	-0.04	0.35	-0.20	0.54	-0.19	-0.52	-0.21	
Winter Snowfall (kg.m-2.s-1)	0.10	-0.39	0.21	-0.38	0.68	-0.19	0.12	-0.21
Annual Wind Speed (Knots)	-0.35	0.37	-0.04	-0.02	-0.23	0.13	-0.19	-0.08
Summer Wind Speed (Knots)	-0.16	0.20	-0.04	-0.36	0.10	0.27	0.00	-0.15
Fall Wind Speed (Knots)	-0.39	0.46	0.05	0.06	-0.23	0.23	0.07	0.15
Winter Wind Speed (Knots)	-0.48	0.12	-0.12	0.01	-0.21	0.27	-0.06	-0.15
Spring Wind Speed (Knots)	-0.11	0.04	0.18	-0.21	0.19	0.03	-0.09	-0.03

	Winter Snowfall (kg.m-2.s-1)	Annual Wind Speed (Knots)	Summer Wind Speed (Knots)	Fall Wind Speed (Knots)	Winter Wind Speed (Knots)	Spring Wind Speed (Knots)
<i>Achnantheidium cf. maritimo-antarcticum</i>	0.5572	0.1316	0.9233	0.1509	0.3907	0.0755
<i>Aulacoseira glubokoyensis</i>	0.8810	0.6403	0.7292	0.3473	0.0446	0.5635
<i>Brachysira minor</i>	0.2763	0.2253	0.7292	0.4357	0.0754	0.5049
<i>Diatomella balfouriana</i>	0.2145	0.1900	0.8970	0.7534	0.8629	0.0031
<i>Eunotia ralitsae</i>	0.4671	0.9741	0.8627	0.4216	0.1985	0.4283
<i>Fragilaria cf. capuccina</i>	0.7261	0.8797	0.5868	0.4291	0.1063	0.3902
<i>Gomphonema maritimo-antarcticum</i>	0.5788	0.3659	0.7708	0.1982	0.0384	0.9732
<i>Gomphonema sp.</i>	0.0000	0.4637	0.6047	0.9603	0.9339	0.3499
<i>Humidophila sp.</i>	0.9330	0.5607	0.2227	0.5018	0.0873	0.6941
<i>Humidophila tabellariaeformis</i>	0.0984	0.9569	0.2861	0.3015	0.6806	0.1659
<i>Melosira cf. varians</i>	0.7625	0.3797	0.3772	0.8441	0.3261	0.0202
<i>Nitzschia cf. kleinteichiana</i>	0.7514	0.4978	0.5419	0.5710	0.4038	0.4767
<i>Pinnularia borealis</i>	0.5770	0.8945	0.2413	0.6278	0.7910	0.6104
<i>Pinnularia cf. australomicrostauron</i>	0.3088	0.0515	0.0299	0.4681	0.7201	0.0063
<i>Pinnularia sp.</i>	0.5563	0.5786	0.1826	0.5635	0.1182	0.7700
<i>Planothidium australe</i>	0.8530	0.2608	0.1712	0.6301	0.1152	0.5607
<i>Psammothidium abundans</i>	0.7763	0.2635	0.6092	0.2153	0.1144	0.7283
<i>Planathidium rostrulanceolatum</i>	0.2600	0.2395	0.5273	0.1335	0.7129	0.9139
<i>Stauroneis cf. delicata</i>	0.5538	0.9089	0.9133	0.8658	0.7023	0.5752
October Ozone in Faraday Station (DU)	0.2763	0.9569	0.2453	0.8542	0.9656	0.5193
Summer cyclone energy (DP)	0.0289	0.4697	0.7456	0.4767	0.5128	0.5635
Air Temperature (°C)*	0.6032	0.6801	0.4038	0.4697	0.3911	0.9225
AAO	0.7507	0.5479	0.9914	0.8200	0.8627	0.7821
Total Cloud Cover	0.5563	0.8287	0.6761	0.6751	0.6761	0.9336
Winter Snowfall (kg.m-2.s-1)		0.9074	0.9074	0.4874	0.6515	0.2276
Annual Wind Speed (Knots)	0.04		0.0354	0.0088	0.0166	0.0141
Summer Wind Speed (Knots)	0.04	0.61		0.1858	0.1908	0.2747
Fall Wind Speed (Knots)	-0.25	0.72	0.41		0.0190	0.4484
Winter Wind Speed (Knots)	0.16	0.67	0.41	0.66		0.8797
Spring Wind Speed (Knots)	0.42	0.68	0.34	0.24	0.05	