

Supplementary Material

On the chemistry of small waterbodies linked to marine aerosols and local geology on the Windmill Islands and mainland near Casey Station, Antarctica

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Table S1. List of all 43 water localities and the two snow samples examined near Casey Station, giving numerous measured parameters and other sampling information.

Geographical area	Additional comments	Locality number	pH	Dissolved oxygen (mg L ⁻¹)	Oxygen saturation (%)	Water temp. (°C)	Air temp. (°C)	K ₁₈ (μS cm ⁻¹)	TDS (ppm)	Date of sampling	Remarks	Presence of organisms seen in the field or under the microscope
Warrington Island		1	8.6			5.6		925	588.5	4/1/83	Dead penguins in the water, sandy substrate	Rotifers, algal mats
Warrington Island		2	7.42			3		2365	1505	4/1/83	Penguin faeces seen in the lake among green substrate	Rotifers, black algae in water
Warrington Island		3	8.11			7		774	>422.5	4/1/83		Rotifers, brown algal mat on rocks
Browning Peninsula		4	8.08	11.8	94	5.8		446	252.5	5/1/83	Part of a stream	Ciliates, brown algal mat on rocks
Browning Peninsula		5	7.55	12.8	100	5		972	563	5/1/83		Brown algal mat on edge
Browning Peninsula		6	7.59			6	4	781	448.5	5/1/83		Rotifers and algae reminiscent of <i>Volvox</i>
Browning Peninsula		7	8.02	13.0	111	8.5	7	475	276	5/1/83		Skuas bathing in the water, presence of bird faeces
Browning Peninsula		8	7.9	11.2	110	10.5		525	292.5	5/1/83		Collembolans
Herring Island		9	7.65	12.8	88	1	1	2696	1772	6/1/83		Algal mats along the shore
Herring Island		10	7.16–7.44	11.6	93	6		3485	2278.5	6/1/83		2 types of rotifers, globular algae
Herring Island		11	7.33			7		2360	3947.5	6/1/83		2 types of rotifers
Herring Island		12	7.55			0		655	395	6/1/83		Elongated rotifers, small green algal matter
Herring Island		13	7.15			9		3070	1959	6/1/83		Rotifers, green and yellow algae, collembolans
Herring Island		43	9.64	12.85	119	12	~7	3800	8105.5	19/1/83	Halite? Deposits on surrounding rocks, note 12°C!	Numerous nematodes, rotifers, thick algal mats, some yellow but green underneath
Bailey Peninsula	Behind Casey Base	14	4.98	11.5	89	4.9	1	142	61	10/1/83		Rotifers, green and yellow algae
Bailey Peninsula	Behind Casey Base	15	5.49	13.6	95	1	5.5	12.1	~7.8	10/1/83		Had to break the ice to sample the water, collembolans with green dorsum
Bailey Peninsula	Behind Casey Base	16	6.79	11.7	98	8	4	25.4	15.5	10/1/83		Skua faeces in water
Bailey Peninsula	Behind Casey Base	17	5.87	13.2	89	0	4	111	55	10/1/83		Green algae
Bailey Peninsula	Behind Casey Base	18	6.08	11.3	78	0	5	20.1	12.3	10/1/83		Light brown algal mat, collembolans
Bailey Peninsula	New base area	19	6.87	Top 12.6	85	0–0.8	3.5	121	122	12/1/83		Affected by pollution, filamentous algae, rotifers
Bailey Peninsula	New base area	19		Bottom 12.8	87							Anoxic and black sediment
Bailey Peninsula	New base area	20	7.57	11.9	88	0		45	27.5	12/1/83	Summer water supply	2 types of ciliates
Bailey Peninsula	New base area	21	6.11	15.7	108	3	2.5	253	127.5	12/1/83		Algal fragments and green algae on one side, collembolans with green dorsum
Bailey Peninsula	New base area	22	5.82	15.4	105	0.2	2.8	36	18	12/1/83	Winter water supply	Wooden beams in lake, covered with ice, ? flatworm
Bailey Peninsula	New base area	23	6.52	11.8	83	0		25	12.5	12/1/83	Lake away from penguin rookery	Pink brown algae, tardigrades
Bailey Peninsula	Adjacent to Casey	24	9.31	13.1	95	1		3306	2135	14/1/83	Pond beside Casey Station	Jelly-like algal mats
Bailey Peninsula	Adjacent to Casey	25	9.05	12.9	87	2–3		2282	1431	14/1/83	Larger pond beside Casey Station	Water green
Bailey Peninsula	New base area	26	6.64	12.1	84	0		264	128	14/1/83	Evidence of this site having been bulldozed	Floating algal mat
Clarke Peninsula		27	7.38	8.1	60	0.9		1668	1085.5	16/1/83	Below penguin rookery	Green enteromorpha-like algae, rotifers
Clarke Peninsula		28	8.3	11.8	99	3	4.5	2485	1770	16/1/83	In front of penguin rookery	Water smelly and brown-green, dead penguin on edge of lake, thin algal mats

Geographical area	Additional comments	Locality number	pH	Dissolved oxygen (mg L ⁻¹)	Oxygen saturation (%)	Water temp. (°C)	Air temp. (°C)	K ₁₈ (μS cm ⁻¹)	TDS (ppm)	Date of sampling	Remarks	Presence of organisms seen in the field or under the microscope
Clarke Peninsula		29	7.45	13.1	89	7.8		5443	4405	16/1/83	Close to penguin rookery, stream flowing from rookery into lake	Water brown, penguin along shore, stream flowing towards loc. 26, <i>Enteromorpha</i> -like algae
Clarke Peninsula	Blakeney Point	30	8.54	11.3	98	0	5	129	67	16/1/83	Below penguin rookery	Red-brown algae covering rocks
Clarke Peninsula	Blakeney Point	31	7.37	12.4	103	9		23	14	16/1/83		Red algal mats, nematodes
Clarke Peninsula	Blakeney Point	32	6.75	12.0	100	7.5	4	20	11.2	16/1/83		Mucilagenous algae among rocks
Clarke Peninsula		33	7.71	8.8	60	7.5		20	11.7	16/1/83	Lake very close to the sea	Filamentous and tufted algae on bottom of lake, <i>Prasiola crisp a</i> (Rod Seppelt, pers. comm..)
Clarke Peninsula	Near Wilkes Base	34	7.75	11.1	76	0		66	37.5	17/1/83	Eastern end of lake adjacent to Wilkes Station building	Oil slick seen in water, drums, wooden material all around the lake, green moss around the lake
Clarke Peninsula	Near Wilkes Base	35	9.45	12.5	100	0		215	155	17/1/83	Western side of Wilkes Station building, ~150 m from the sea	Hard to sample as it was covered with ice
Clarke Peninsula	Near Wilkes Base	36	7.35	12.6		6		1542	1076	17/1/83	50 m from the sea, ~5 m above sea level	Brown algal mats, rotifers, red (algal?) globules
Clarke Peninsula	Near Wilkes Base	37	8.16	13.1	89	0		8811	31538	17/1/83	Connected to the sea, presence of seaweed, 1 penguin seen	Brown algal mats at bottom, one penguin in water
Clarke Peninsula	Near Wilkes Base	38	6.42	12.2	90	0		304	170	17/1/83		Rubbish in lake, including cardboard and wooden box, filamentous algae recovered in plankton net, rusted can
Holl Island		39	7.19	12.65	89	3		514	281.5	19/1/83		Penguin and skua near lake, rotifers
Holl Island		40	7.14	12.6	88	1		544	298	19/1/83		Penguins and skuas near lake
Holl Island		41	8.36	12.9	92	1		1598	1120	19/1/83	Close to penguin rookery	Water greenish, <i>Enteromorpha</i> -like algae
Ford Island		42	8.98	12.85	119	1.8		2225	1935	19/1/83		Black algal mats, red worm-like organisms
Casey Base	Met. Bureau station	Snow A							>56	12/12/82		
Casey Base	Met. Bureau station	Snow B	7.58						>21.1	12/1/83		

Table S2. Chemical analyses of major elements for the 43 waters and 2 snow samples near Casey Station.

Locality number	Geographical area	Additional comments	Na (ppm)	Cl (ppm)	Ca (ppm)	Mg (ppm)	K (ppm)	Sr (ppm)	HCO ₃	SO ₄	Si (ppm)	TDS	NO ₃ (ppm)	PO ₄ (ppm)
1	Warrington Island		198	330	3.2	3.24	4.96	0.083	13	36	0.33	588.5		
2	Warrington Island		489	846	13	13.6	22	0.251	10	111	0.34	1505		
3	Warrington Island		149	255	2.76	3.08	3.47	0.081	9	NM	0.6	>422.5		
4	Browning Peninsula		74.7	149	3.41	3.08	1.47	0.069	4	16.5	2.08	252.5		
5	Browning Peninsula		173	330	8.31	7.84	3.29	0.129	10	30	<.02	563		
6	Browning Peninsula		134	271	5.56	6.01	2.56	0.04	4	25.2	5.29	448.5		
7	Browning Peninsula		82.2	164	3.97	3.52	1.4	0.013	5	17.3	<.02	276		
8	Browning Peninsula		88.3	172	4.16	3.68	1.72	0.068	4	18.5	7.46	292.5	5.39	3.62
9	Herring Island		537	996	21.4	66.8	20.3	0.424	10	120	0.54	1772		
10	Herring Island		691	1310	24.3	78.3	27.3	0.48	10	137	1.29	2278.5		
11	Herring Island		470	814	17.2	41.5	25.7	0.272	16	81.5	<0.02	3947.5	0.34	
12	Herring Island		121	233	3.72	7.3	2.47	0.07	-3	24	<0.02	395		
13	Herring Island		606	1099	23.8	69.8	24.8	0.408	10	125	0.31	1959		
43	Herring Island		2354	4393	98.4	349	326	1.871	28	555	0.88	8105.5		
14	Bailey Peninsula	Behind Casey Base	15.8	29.4	2.4	1.16	2.38	0.016	≤3	6.7	2.33	~61		
15	Bailey Peninsula	Behind Casey Base	1.52	2.79	0.09	0.2	0.17	0.008	≤2	1	0.49	~7.8		
16	Bailey Peninsula	Behind Casey Base	3.32	5.8	0.29	0.46	0.4	<0.004	~3	2.2	0.61	15.5		4.23
17	Bailey Peninsula	Behind Casey Base	15.6	27.8	1.65	0.85	1.66	<0.004	≤2	5.5	2.77	~55		
18	Bailey Peninsula	Behind Casey Base	2.96	4.49	0.15	0.42	0.25	<0.004	≤2	2	1.65	~12.3	5.40	
19	Bailey Peninsula	New base area	17.4	27.1	1.37	0.83	1.23	0.006	4	70	0.34	122		
20	Bailey Peninsula	New base area	6.74	11.1	0.51	0.85	0.53	0.013	4	3.5	4.26	27.5		
21	Bailey Peninsula	New base area	36.5	60	1.79	1.65	2.72	0.015	~3	21.8	0.03	~127.5	6.37	3.54
22	Bailey Peninsula	New base area	4.23	7.52	0.29	0.76	0.42	<0.004	≤2	2.8	1.79	~18	7.12	
23	Bailey Peninsula	New base area	2.67	5.26	0.15	0.63	0.12	<0.004	≤2	1.5	0.69	~12.5		
24	Bailey Peninsula	Adjacent to 'Old' Casey	684	1199	27.4	76	27.3	0.42	33	87.6	1.62	2135	5.40	3.50
25	Bailey Peninsula	Adjacent to 'Old' Casey	438	782	20.7	44.6	19.4	0.249	36	90.1	2.86	1431	2.83	
26	Bailey Peninsula	New base area	37.8	63.3	2.41	1.96	2.29	0.01	5	15.3	1.84	128		
27	Clark Peninsula		322	567	21.4	43.6	22.8	0.218	26	82.4	0.52	1085.5		
28	Clark Peninsula		484	915	29.2	60.5	54	0.277	41	186	<0.02	1770		
29	Clark Peninsula		1153	2253	720	145.3	136	0.638	75	570	7.92	4405		
30	Clark Peninsula		19.5	33.1	1.73	0.78	0.43	0.007	7	4.5	1.01	67		
31	Clark Peninsula		2.04	5.35	0.29	0.39	0.28	<0.004	~3	2.3	1.48	14	0.15	0.60
32	Clark Peninsula		1.97	3.86	0.09	0.38	0.37	<0.004	~3	1.5	<0.02	11.2		
33	Clark Peninsula		1.64	4.09	0.21	0.29	0.17	<0.004	~3	2.3	<0.02	11.7		
34	Clark Peninsula	Near Wilkes Base	10.6	11.5	0.23	0.54	0.46	<0.004	11	2.8	<0.02	37.5		0.29
35	Clark Peninsula	Near Wilkes Base	45.9	25.6	0.45	0.51	1.24	<0.004	72	9	1.04	155		0.66
36	Clark Peninsula	Near Wilkes Base	362	558	11.8	34.3	18.5	0.235	8	830	3.46	1076	0.05	0.29
37	Clark Peninsula	Near Wilkes Base	8994	17774	388	1245	457	8.051	79	2593	5.44	31538		4.26
38	Clark Peninsula	Near Wilkes Base	49.3	95.1	1.35	2.03	1.11	0.014	6	14.9	4.01	170	3.67	2.33
39	Holl Island		87.9	151	2.23	12.2	4.83	0.034	~3	20	<0.02	281.5	2.86	1.80
40	Holl Island		94.6	164	3.08	9.7	5.66	0.036	≤2	18.5	<0.02	~298		
41	Holl Island		361	638	11.7	35.5	18.9	0.188	6	48.6	26.4	1120		
42	Ford Island		588	1071	28	69.1	26.2	0.411	19	133	<.02	1935		
Snow A	Casey Base	Met. Bureau station	35.7	16.3	2.49	0.52	0.83	0.013				>56		
Snow B	Casey Base	Met. Bureau station	10.3	7.23	0.68	0.52	1.41	0.019				>21.2		

The colour scheme used here is the same used in the Piper diagram in Fig. 4–9. NM, not measured.

Table S3. Additional information on the chemistry of the 43 waters and 2 snow samples from near Casey Station, listing also numerous molar ratios.

Locality number	Geographical area	Additional comments	Na ⁺	Cl ⁻	Ca ²⁺	Mg ²⁺	K ⁺	HCO ₃ ⁻ (meq L ⁻¹)	Li ⁺	SO ₄ ²⁻	NO ₃ ⁻	PO ₄ ³⁺	Br ⁻
1	Warrington Island		8.612	9.308	0.08	0.133	0.127	0.213	0.001729	0.375	NM	NM	0.0116343
2	Warrington Island		21.27	23.863	0.324	0.559	0.563	0.164	0.003026	1.156	NM	NM	0.0061299
3	Warrington Island		6.481	7.193	0.069	0.127	0.089	0.147	0.001729	NM	NM	NM	0.008757
4	Browning Peninsula		3.249	4.203	0.085	0.127	0.038	0.066	0.001585	0.172	NM	NM	0.0007506
5	Browning Peninsula		7.525	9.308	0.207	0.322	0.084	0.164	NM	0.312	NM	NM	0.0071307
6	Browning Peninsula		5.829	7.644	0.139	0.247	0.065	0.066	0.0002882	0.262	NM	NM	0.0060048
7	Browning Peninsula		3.575	4.626	0.099	0.145	0.036	0.082	0.0002882	0.18	NM	NM	0.0011259
8	Browning Peninsula		3.841	4.851	0.104	0.151	0.044	0.066	NM	0.193	0.086941	0.114356	0.0040032
9	Herring Island		23.358	28.094	0.534	2.748	0.519	0.164	0.001441	1.249	NM	NM	0.0240192
10	Herring Island		30.057	36.95	0.606	3.221	0.698	0.164	0.011528	1.426	NM	NM	0.023769
11	Herring Island		20.444	22.96	0.429	1.707	0.657	0.262	0.0005764	0.848	0.005484	NM	0.0228933
12	Herring Island		5.263	6.572	0.093	0.3	0.063	0.049	NM	0.25	NM	NM	0.0067554
13	Herring Island		26.359	30.999	0.594	2.871	0.634	0.164	0.001729	1.301	NM	NM	0.0226431
43	Herring Island		102.392	123.911	2.455	14.355	8.338	0.459	0.004899	5.778	NM	NM	0.138861
14	Bailey Peninsula	Behind Casey Base	0.687	0.829	0.06	0.048	0.061	0.049	0.001879	0.07	0.31131	0.056686	0.0015012
15	Bailey Peninsula	Behind Casey Base	0.066	0.079	0.202	0.008	0.004	0.033	0.0005764	0.01	NM	NM	NM
16	Bailey Peninsula	Behind Casey Base	0.144	0.164	0.007	0.019	0.01	0.049	NM	0.023	NM	0.13363	0.018765
17	Bailey Peninsula	Behind Casey Base	0.679	0.784	0.041	0.035	0.042	0.033	0.0002882	0.057	0.16291	0.01817	0.0007506
18	Bailey Peninsula	Behind Casey Base	0.129	0.127	0.004	0.017	0.006	0.033	NM	0.021	0.0871	NM	NM
19	Bailey Peninsula	New base area	0.757	0.764	0.034	0.034	0.031	0.066	NM	0.729	0.06049	0.03015	NM
20	Bailey Peninsula	New base area	0.293	0.313	0.013	0.035	0.014	0.066	NM	0.036	0.10275	0.000829	NM
21	Bailey Peninsula	New base area	1.588	1.692	0.045	0.068	0.07	0.049	0.0004323	0.227	0.11485	NM	0.0026271
22	Bailey Peninsula	New base area	0.184	0.212	0.007	0.031	0.011	0.033	0.0002882	0.029	0.12646	NM	NM
23	Bailey Peninsula	New base area	0.116	0.148	0.004	0.026	0.003	0.033	NM	0.016	0.0871	0.110565	NM
24	Bailey Peninsula	Adjacent to Casey	29.752	33.819	0.684	3.126	0.698	0.541	0.002017	0.912	0.045648	NM	0.0444105
25	Bailey Peninsula	Adjacent to Casey	19.052	22.057	0.516	1.834	0.496	0.590	0.0007205	0.938	0.17259	0.05907	0.0374049
26	Bailey Peninsula	New base area	1.644	1.785	0.06	0.081	0.059	0.082	NM	0.159	0.157106	NM	0.0021267
27	Clarke Peninsula		14.006	15.993	0.534	1.793	0.583	0.426	0.0005764	0.858	0.814565	0.6444	0.0314001
28	Clarke Peninsula		21.053	25.809	0.729	2.488	1.381	0.672	0.001441	1.936	0.812952	1.108809	0.0382806
29	Clarke Peninsula		50.152	63.549	1.796	5.976	3.478	1.229	0.00879	5.934	2.83888	2.89996	0.0271467
30	Clarke Peninsula		0.848	0.934	0.043	0.032	0.011	0.115	0.02017	0.047	0.0024195	0.018954	0.0011259
31	Clarke Peninsula		0.089	0.151	0.007	0.016	0.007	0.049	0.001873	0.024	NM	NM	NM
32	Clarke Peninsula		0.086	0.109	0.002	0.016	0.009	0.049	0.0007205	0.016	NM	0.009161	NM
33	Clarke Peninsula		0.071	0.115	0.005	0.012	0.004	0.049	NM	0.024	NM	0.020849	NM
34	Clarke Peninsula	Near Wilkes Base	0.461	0.324	0.006	0.022	0.012	0.18	NM	0.029	NM	0.009161	NM
35	Clarke Peninsula	Near Wilkes Base	1.997	0.722	0.011	0.021	0.032	1.18	0.002017	0.094	NM	0.03457	0.0013761
36	Clarke Peninsula	Near Wilkes Base	15.746	15.739	0.294	1.411	0.473	0.131	0.001153	0.864	NM	NM	0.0267714
37	Clarke Peninsula	Near Wilkes Base	391.214	501.34	9.681	51.209	11.689	1.295	0.34296	26.994	NM	NM	0.38781
38	Clarke Peninsula	Near Wilkes Base	2.144	2.682	0.034	0.083	0.028	0.098	0.002162	0.155	NM	NM	0.0032526
39	Holl Island		3.823	4.259	0.056	0.502	0.124	0.049	0.01153	0.208	NM	NM	0.0055044
40	Holl Island		4.115	4.626	0.077	0.399	0.145	0.033	0.0007205	0.193	NM	NM	0.0001251
41	Holl Island		15.702	17.996	0.292	1.46	0.483	0.098	0.0002882	0.506	NM	NM	0.0281475
42	Ford Island		25.576	30.209	0.699	2.842	0.67	0.311	0.0005764	1.385	NM	NM	0.0347778
Snow A	Casey Base	Met. Bureau station	1.553	0.46	0.062	0.021	0.021	NM	NM	NM	NM	NM	
Snow B	Casey Base	Met. Bureau station	0.448	0.204	0.017	0.021	0.036	NM	NM	NM	NM	NM	

Table S3. (Cont.)

Locality number	Geographical area	Additional comments	Na ⁺	Cl ⁻	Ca ²⁺	Mg ²⁺ (%meq)	K ⁺	HCO ₃ ⁻	SO ₄ ²⁻
1	Warrington Island		45.68	49.38	0.42	0.7	0.67	1.13	1.98
2	Warrington Island		44.40.	49.81	0.67	1.16	1.17	0.34	2.41
3	Warrington Island								
4	Browning Peninsula		40.91	52.92	1.07	1.59	0.47	0.83	2.16
5	Browning Peninsula		41.98	51.93	1.15	1.79	0.46	0.91	1.74
6	Browning Peninsula		40.90.	53.63	0.97	1.73	0.45	0.46	1.83
7	Browning Peninsula		40.?	52.91	1.13	1.65	0.41	0.93	2.05
8	Browning Peninsula		41.52	52.43	1.12	1.63	0.47	0.71	2.08
9	Herring Island		41.21	49.57	0.94	4.84	0.91	0.28	2.20.
10	Herring Island		41.10.	50.52	0.82	4.40.	0.95	0.22	1.95
11	Herring Island		43.21	48.53	0.90.	3.60.	1.38	0.55	1.79
12	Herring Island		41.80.	52.19	0.73	2.38	0.50.	0.38	1.98
13	Herring Island		41.88	49.26	0.94	4.56	1.00.	0.26	2.06
43	Herring Island		39.73	48.08	0.95	5.57	3.23	0.17	2.24
14	Bailey Peninsula	Behind Casey Base	38.08	45.90.	3.32	2.66	3.38	2.71	3.88
15	Bailey Peninsula	Behind Casey Base	32.67	39.10.	0.99	3.96	1.98	16.33	4.95
16	Bailey Peninsula	Behind Casey Base	34.61	39.42	1.68	4.56	2.40.	11.77	5.52
17	Bailey Peninsula	Behind Casey Base	40.63	46.91	2.45	2.09	2.51	1.97	3.41
18	Bailey Peninsula	Behind Casey Base	38.27	37.68	1.18	5.04	1.78	9.79	6.23
19	Bailey Peninsula	New base area	31.34	31.63	1.40.	1.40.	1.28	2.73	30.18
20	Bailey Peninsula	New base area	38.05	40.64	1.68	4.54	1.81	8.57	4.67
21	Bailey Peninsula	New base area	42.47	45.25	1.20.	1.81	1.87	1.31	6.07
22	Bailey Peninsula	New base area	36.29	41.81	1.38	6.11	2.17	6.50.	5.72
23	Bailey Peninsula	New base area	33.52	42.77	1.15	7.51	0.86	9.53	4.62
24	Bailey Peninsula	Adjacent to Casey	42.78	48.63	0.98	4.49	1.00.	0.77	1.31
25	Bailey Peninsula	Adjacent to Casey	41.88	48.49	1.13	4.03	1.09	1.29	2.06
26	Bailey Peninsula	New base area	42.48	46.12	1.55	2.09	1.52	2.11	4.1
27	Clarke Peninsula		40.95	46.77	1.56	5.24	1.70.	1.24	2.5
28	Clarke Peninsula		38.93	47.73	1.34	4.60.	2.55	1.24	3.58
29	Clarke Peninsula		37.95	48.09	1.35	4.52	2.63	0.93	4.49
30	Clarke Peninsula		41.77	46.01	2.11	1.57	0.54	5.66	2.31
31	Clarke Peninsula		25.94	44.02	2.04	4.66	2.04	14.28	6.99
32	Clarke Peninsula		29.96	37.97	0.69	5.57	3.13	17.07	5.57
33	Clarke Peninsula		25.35	41.07	1.78	4.28	1.42	17.50.	8.57
34	Clarke Peninsula	Near Wilkes Base	44.58	31.33	0.58	2.12	1.16	17.40.	2.80.
35	Clarke Peninsula	Near Wilkes Base	49.22	17.79	0.27	0.51	0.78	29.08	2.31
36	Clarke Peninsula	Near Wilkes Base	45.42	45.40.	0.84	4.07	1.36	0.37	2.49
37	Clarke Peninsula	Near Wilkes Base	39.37	50.46	0.97	5.15	1.17	0.13	2.71
38	Clarke Peninsula	Near Wilkes Base	41.04	51.34	0.65	1.58	0.53	1.87	2.96
39	Holl Island		42.37	47.21	0.62	5.56	1.37	0.54	2.30.
40	Holl Island		42.91	48.24	0.80.	4.16	1.51	0.34	2.01
41	Holl Island		42.97	49.25	0.79	3.99	1.32	0.26	1.38
42	Ford Island		41.45	48.96	1.13	4.60.	1.08	0.50.	2.24
Snow A	Casey Base	Met. Bureau station							
Snow B	Casey Base	Met. Bureau station							

Table S3. (Cont.)

Locality number	Geographical area	Additional comments	Cl/Na (meq L ⁻¹)	Na+K/Ca+Mg	TDS	Mg/Ca (meq L ⁻¹)	Na/K	Na+K	Ca+Mg	Na+K/Ca+Mg	Cl/Br (meq L ⁻¹)	Ca/SO ₄
1	Warrington Island		1.08	41.03	588.5	1.66	67.8	8.739	0.213	41.03	800.05	0.213
2	Warrington Island		1.121	24.73	1505	1.73	37.8	21.833	0.883	24.73	3892.89	0.28
3	Warrington Island		1.109	33.52	>422.5	1.84	72.8	6.57	0.196	33.52	821.4	
4	Browning Peninsula		1.293	15.5	252.5	1.49	85.5	3.287	0.212	15.5	5599.52	0.494
5	Browning Peninsula		1.236	14.38	563	1.56	89.6	7.609	0.529	14.38	1305.34	0.663
6	Browning Peninsula		1.311	15.27	448.5	1.78	89.7	5.894	0.386	15.27	1272.98	0.531
7	Browning Peninsula		1.293	14.8	276	1.46	99.3	3.611	0.244	14.8	4108.71	0.55
8	Browning Peninsula		1.262	15.24	292.5	1.45	87.3	3.885	0.255	15.24	1211.78	0.539
9	Herring Island		1.202	7.28	1772	5.15	45.0	23.877	3.282	7.28	1169.65	0.428
10	Herring Island		1.229	8.04	2278.5	5.32	43.1	30.755	3.827	8.04	1554.55	0.425
11	Herring Island		1.123	9.88	3947.5	3.98	31.1	21.101	2.136	9.88	1002.91	0.506
12	Herring Island		1.248	13.55	395	3.23	83.5	5.326	0.393	13.55	972.85	0.372
13	Herring Island		1.176	7.79	1959	4.83	41.6	26.993	3.465	7.79	1369.03	0.457
43	Herring Island		1.21	6.59	8105.5	5.85	12.3	110.73	16.81	6.59	892.34	0.425
14	Bailey Peninsula	Behind Casey Base	1.206	6.93	61	0.8	11.3	0.748	0.108	6.93	552.22	0.857
15	Bailey Peninsula	Behind Casey Base	1.196	0.33	~7.8	4.00	16.5	0.07	0.21	0.33		20.2
16	Bailey Peninsula	Behind Casey Base	1.138	5.92	15.5	2.71	14.4	0.154	0.026	5.92	8.74	0.304
17	Bailey Peninsula	Behind Casey Base	1.154	9.49	55	0.85	16.2	0.721	0.076	9.49	1044.5	0.719
18	Bailey Peninsula	Behind Casey Base	0.984	6.43	12.3	4.25	21.5	0.135	0.021	6.43		0.19
19	Bailey Peninsula	New base area	1.009	11.59	122	1	24.4	0.788	0.068	11.59		0.047
20	Bailey Peninsula	New base area	1.068	6.4	27.5	2.69	20.9	0.307	0.048	6.4		0.361
21	Bailey Peninsula	New base area	1.065	14.67	127.5	1.51	22.7	1.658	0.113	14.67	644.06	0.198
22	Bailey Peninsula	New base area	1.152	5.13	18	4.43	16.7	0.195	0.038	5.13		0.241
23	Bailey Peninsula	New base area	1.275	3.97	12.5	6.5	38.7	0.119	0.03	3.97		0.25
24	Bailey Peninsula	Adjacent to Casey	1.136	7.99	2135	4.57	42.6	30.45	3.81	7.99	761.51	0.75
25	Bailey Peninsula	Adjacent to Casey	1.157	8.32	1431	3.55	38.4	19.548	2.35	8.32	589.68	0.55
26	Bailey Peninsula	New base area	1.085	12.08	128	1.35	27.9	1.703	0.141	12.08	839.33	0.377
27	Clarke Peninsula		1.141	6.27	1085.5	3.36	24	14.589	2.327	6.27	509.33	0.622
28	Clarke Peninsula		1.225	6.97	1770	3.41	15.2	22.434	3.217	6.97	674.21	0.377
29	Clarke Peninsula		1.267	6.9	4405	3.33	14.4	53.63	7.772	6.9	2340.95	0.303
30	Clarke Peninsula		1.101	11.45	67	0.74	77.1	0.859	0.075	11.45	829.56	0.915
31	Clarke Peninsula		1.696	4.17	14	2.29	12.7	0.096	0.023	4.17		0.292
32	Clarke Peninsula		1.267	5.28	11.2	8	9.6	0.095	0.018	5.28		0.125
33	Clarke Peninsula		1.619	4.41	11.7	2.4	17.8	0.075	0.017	4.41		0.208
34	Clarke Peninsula	Near Wilkes Base	0.702	16.89	37.5	3.67	38.4	0.473	0.028	16.89		0.207
35	Clarke Peninsula	Near Wilkes Base	0.361	63.41	155	1.91	62.4	2.029	0.032	63.41	524.67	0.117
36	Clarke Peninsula	Near Wilkes Base	0.999	9.51	1076	4.8	33.2	16.219	1.705	9.51	587.9	0.34
37	Clarke Peninsula	Near Wilkes Base	1.281	6.62	31538	5.29	33.5	402.903	60.89	6.62	1292.75	0.359
38	Clarke Peninsula	Near Wilkes Base	1.25	18.56	170	2.44	76.6	2.172	0.117	18.56	824.57	0.219
39	Holl Island		1.114	7.07	281.5	8.96	30.8	3.947	0.558	7.07	773.74	0.269
40	Holl Island		1.124	8.95	298	5.18	28.4	4.26	0.476	8.95	36978.42	0.399
41	Holl Island		1.146	9.24	1120	5	32.5	16.185	1.752	9.24	639.35	0.577
42	Ford Island		1.181	7.41	1935	4.07	38.2	26.246	3.541	7.41	868.63	0.505
Snow A	Casey Base	Met. Bureau station	0.296	18.96	>56	0.34	74	1.574	0.083	18.96		
Snow B	Casey Base	Met. Bureau station	0.455	12.74	>21.2	1.24	12.4	0.484	0.038	12.74		

NM, not measured.

Table S4. Chemical analyses and resulting PHREEQC results for the 43 water samples from near Casey Station.

Locality	Number	Date	pH	O _{2(aq)}	Temp.	TDS	Ca ²⁺	Mg ²⁺	Na+	K+	CO ₃ ²⁻	SO ₄ ²⁻	Cl ⁻	Sr ²⁺	Li ⁺	Fe ²⁺	Mn ²⁺	Cu ²⁺	H ₄ SiO ₄
				(mg L ⁻¹)	(°C)														
Warrington Island	1	4/01/1983			5.6	588.5	3.2	3.24	198	4.96	12.79	36	330	0.083	0.012	<0.005	0.1	0.14	5.28E-01
Warrington Island	2	4/01/1983			3	1505	13	13.6	489	22	9.835	111	846	0.251	0.021	<0.005	0.1	0.12	0.5439
Warrington Island	3	4/01/1983			7	>422.5	2.76	3.08	149	3.47	8.852	NM	255	0.081	0.012	<0.005	0.1	0.12	0.9598
Browning Peninsula	4	5/01/1983		11.8	5.8	252.5	3.41	3.08	74.7	1.47	3.934	16.5	149	0.069	0.011	<0.005	0.1	<0.003	3.33E+00
Browning Peninsula	5	5/01/1983		12.8	5	563	8.31	7.84	173	3.29	9.835	30	330	0.129	<0.002	<0.005	0.09	0.11	<0.03199
Browning Peninsula	6	5/01/1983			6	448.5	5.56	6.01	134	2.56	3.934	25.2	271	0.04	0.002	<0.005	<0.003	<0.003	8.46E+00
Browning Peninsula	7	5/01/1983		13.0	8.5	276	3.97	3.52	82.2	1.4	4.918	17.3	164	0.013	0.002	<0.005	<0.003	<0.003	<0.03199
Browning Peninsula	8	5/01/1983		11.2	10.5	292.5	4.16	3.68	88.3	1.72	3.934	18.5	172	0.068	<0.002	<0.005	<0.003	<0.003	1.19E+01
Herring Island	9	6/01/1983		12.8	1	1772	21.4	66.8	537	20.3	9.835	120	996	0.424	0.010	<0.005	<0.003	<0.003	0.8639
Herring Island	10	6/01/1983	8.6	11.6	6	2279	24.3	78.3	691	27.3	9.835	137	1310	0.48	0.008	0.01	<0.003	<0.003	2.064
Herring Island	11	6/01/1983	7.42		7	3948	17.2	41.5	470	25.7	15.74	81.5	814	0.272	0.004	0.13	0.33	0.05	<0.03199
Herring Island	12	6/01/1983	8.11		0	395	3.72	7.3	121	2.47	2.951	24	233	0.07	<0.002	0.09	<0.003	0.11	<0.03199
Herring Island	13	6/01/1983	8.08		9	1959	23.8	69.8	606	24.8	9.835	125	1099	0.408	0.012	0.07	0.07	0.11	0.4959
Herring Island	43	19/01/1983	7.55	12.85	12	8106	98.4	349	2354	326	27.54	555	4393	1.871	0.034	0.02	0.12	0.03	1.408
Bailey Peninsula	14	10/01/1983	7.59	11.5	4.9	61	2.4	1.16	15.8	2.38	2.951	6.7	29.4	0.016	0.013	0.06	0.16	0.04	3.73E+00
Bailey Peninsula	15	10/01/1983	8.02	13.6	1	-7.8	0.09	0.2	1.52	0.17	1.967	1	2.79	0.008	0.004	0.05	0.03	0.1	7.84E-01
Bailey Peninsula	16	10/01/1983	7.9	11.7	8	15.5	0.29	0.46	3.32	0.4	2.951	2.2	5.8	<0.004	<0.002	<0.005	<0.003	<0.003	9.76E-01
Bailey Peninsula	17	10/01/1983	7.65	13.2	0	55	1.65	0.85	15.6	1.66	1.967	5.5	27.8	<0.004	0.002	<0.005	0.03	<0.003	4.43E+00
Bailey Peninsula	18	10/01/1983	7.16-7.44	11.3	0	12.3	0.15	0.42	2.96	0.25	1.967	2	4.49	<0.004	<0.002	<0.005	<0.003	<0.003	2.64E+00
Bailey Peninsula	19	12/01/1983	7.33	12.6	0.8	122	1.37	0.83	17.4	1.23	3.934	70	27.1	0.006	<0.002	<0.005	0.03	<0.003	5.44E-01
Bailey Peninsula	20	12/01/1983	7.15	11.9	0	27.5	0.51	0.85	6.74	0.53	3.934	3.5	11.1	0.013	<0.002	<0.005	0.03	<0.003	6.82E+00
Bailey Peninsula	21	12/01/1983	9.64	15.7	3	127.5	1.79	1.65	36.5	2.72	2.951	21.8	60	0.015	0.003	<0.005	0.05	0.07	4.80E-02
Bailey Peninsula	22	12/01/1983	4.98	15.4	0.2	18	0.29	0.76	4.23	0.42	1.967	2.8	7.52	<0.004	0.002	<0.005	<0.003	0.11	2.86E+00
Bailey Peninsula	23	12/01/1983	5.49	11.8	0	12.5	0.15	0.63	2.67	0.12	1.967	1.5	5.26	<0.004	<0.002	<0.005	0.01	0.16	1.10E+00
Bailey Peninsula	24	14/01/1983	6.79	13.1	1	2135	27.4	76	684	27.3	32.46	87.6	1199	0.42	0.014	<0.005	<0.003	0.11	2.592
Bailey Peninsula	25	14/01/1983	5.87	12.9	3	1431	20.7	44.6	438	19.4	35.41	90.1	782	0.249	0.005	<0.005	0.01	0.1	4.575
Bailey Peninsula	26	14/01/1983	6.08	12.1	0	128	2.41	1.96	37.8	2.29	4.918	15.3	63.3	0.01	<0.002	<0.005	0.02	0.05	2.94E+00
Clarke Peninsula	27	16/01/1983	6.87	8.1	0.9	1086	21.4	43.6	322	22.8	25.57	82.4	567	0.218	0.004	<0.005	0.05	0.07	0.8319
Clarke Peninsula	28	16/01/1983		11.8	3	1770	29.2	60.5	484	54	40.32	186	915	0.277	0.010	<0.005	0.07	0.03	<0.03199
Clarke Peninsula	29	16/01/1983	7.57	13.1	7.8	4405	720	145.3	1153	136	73.76	570	2253	0.638	0.061	<0.005	<0.003	0.19	12.67
Clarke Peninsula	30	16/01/1983	6.11	11.3	0	67	1.73	0.78	19.5	0.43	6.885	4.5	33.1	0.007	0.014	<0.005	<0.003	0.08	1.62E+00
Clarke Peninsula	31	16/01/1983	5.82	12.4	9	14	0.29	0.39	2.04	0.28	2.951	2.3	5.35	<0.004	0.013	<0.005	0.19	0.09	2.37E+00
Clarke Peninsula	32	16/01/1983	6.52	12	7.5	11.2	0.09	0.38	1.97	0.37	2.951	1.5	3.86	<0.004	0.005	<0.005	<0.003	0.12	<0.03199
Clarke Peninsula	33	16/01/1983	9.31	8.8	7.5	11.7	0.21	0.29	1.64	0.17	2.951	2.3	4.09	<0.004	<0.002	<0.005	0.13	0.06	<0.03199
Clarke Peninsula	34	17/01/1983	9.05	11.1	0	37.5	0.23	0.54	10.6	0.46	10.82	2.8	11.5	<0.004	<0.002	0.16	<0.003	0.13	<0.03199
Clarke Peninsula	35	17/01/1983	6.64	12.5	0	155	0.45	0.51	45.9	1.24	70.81	9	25.6	<0.004	0.014	0.27	0.03	0.004	1.66E+00
Clarke Peninsula	36	17/01/1983	7.38	12.6	6	1076	11.8	34.3	362	18.5	7.868	830	558	0.235	0.008	<0.005	<0.003	0.003	5.535
Clarke Peninsula	37	17/01/1983	8.3	13.1	0	31538	388	1245	8994	457	77.7	2593	17774	8.051	0.238	<0.005	<0.003	0.007	8.703
Clarke Peninsula	38	17/01/1983	7.45	12.2	0	170	1.35	2.03	49.3	1.11	5.901	14.9	95.1	0.014	0.015	0.02	<0.003	0.06	6.42E+00
Holl Island	39	19/01/1983	8.54	12.65	3	281.5	2.23	12.2	87.9	4.83	2.951	20	151	0.034	0.008	<0.005	<0.003	0.005	<0.03199
Holl Island	40	19/01/1983	7.37	12.6	1	298	3.08	9.7	94.6	5.66	1.967	18.5	164	0.036	0.005	0.02	<0.003	0.06	<0.03199
Holl Island	41	19/01/1983	6.75	12.9	1	1120	11.7	35.5	361	18.9	5.901	48.6	638	0.188	0.002	0.06	0.11	<0.003	4.22E+01
Ford Island	42	19/01/1983	7.71	12.85	1.8	1935	28	69.1	588	26.2	18.69	133	1071	0.411	0.004	0.01	0.04	<0.003	<0.03199
Casey Base	Snow A	12/12/1982	7.75			>56	2.49	0.52	35.7	0.83			16.3	0.013	<0.002				
Casey Base	Snow B	12/01/1983	9.45			>21.1	0.68	0.52	10.3	1.41			7.23	0.019	<0.002				

