APPENDIX

TABLE OF FIGURES

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Table A.4.1: Full ANOVA and Tukey test of coastal water Mg concentrations

ANOVA: Single Factor

DESCRIPTION — Alpha 0.05

Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1	2	0.077427	0.038713	5.96E-08	5.96E-08	0.000351	0.037812	0.039615
2	2	0.103325	0.051663	6.58E-07	6.58E-07	0.000351	0.050761	0.052564
3	2	0.104883	0.052442	4.59E-07	4.59E-07	0.000351	0.05154	0.053343
4	2	0.103317	0.051658	2.87E-08	2.87E-08	0.000351	0.050757	0.05256
6	2	0.068489	0.034244	2.51E-08	2.51E-08	0.000351	0.033343	0.035146

ANOVA

Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.000593	4	0.000148	602.8607	6.81E-07	0.997931	17.36175	0.995863
Within Groups	1.23E-06	5	2.46E-07					
Total	0.000594	9	6.6E-05					

TUKEY HSD/KRAMER — alpha 0.05

group	*mean*	*n*	*ss*	*df*	*q-crit*
1	0.038713	2	5.96E-08		
2	0.051663	2	6.58E-07		
3	0.052442	2	4.59E-07		
4	0.051658	2	2.87E-08		
6	0.034244	2	2.51E-08		
		10	1.23E-06	5	5.673

Q TEST

group 1	*group 2*	*mean*	*std err*	*q-stat*	*lower*	*upper*	*p-value*	*mean-crit*	*Cohen d*
1	2	0.012949	0.000351	36.92669	0.01096	0.014938	8.72E-06	0.001989	26.11111
1	3	0.013728	0.000351	39.14822	0.011739	0.015718	7.14E-06	0.001989	27.68197
1	4	0.012945	0.000351	36.91492	0.010956	0.014934	8.73E-06	0.001989	26.10279
1	6	0.004469	0.000351	12.74405	0.00248	0.006458	0.001522	0.001989	9.011406
2	3	0.000779	0.000351	2.221532	-0.00121	0.002768	0.567593	0.001989	1.57086
2	4	4.13E-06	0.000351	0.011773	-0.00199	0.001993	1	0.001989	0.008324
2	6	0.017418	0.000351	49.67074	0.015429	0.019407	3.29E-06	0.001989	35.12252
3	4	0.000783	0.000351	2.233304	-0.00121	0.002773	0.563535	0.001989	1.579185
3	6	0.018197	0.000351	51.89228	0.016208	0.020186	2.77E-06	0.001989	36.69338
4	6	0.017414	0.000351	49.65897	0.015425	0.019403	3.3E-06	0.001989	35.1142

Table A.4.2: Full ANOVA and Tukey test of coastal water Ca concentration.

ANOVA: Single Factor

DESCRIPTION — Alpha 0.05

Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1	2	0.012443	0.006222	1.16E-07	1.16E-07	0.000222	0.005652	0.006792
2	2	0.019133	0.009567	5.37E-08	5.37E-08	0.000222	0.008996	0.010137
3	2	0.01999	0.009995	1.8E-08	1.8E-08	0.000222	0.009425	0.010565
4	2	0.020437	0.010219	1.57E-08	1.57E-08	0.000222	0.009648	0.010789
6	2	0.00969	0.004845	2.88E-07	2.88E-07	0.000222	0.004275	0.005415

ANOVA

Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	4.87E-05	4	1.22E-05	123.6227	3.48E-05	0.98999	7.862021	0.98002
Within Groups	4.92E-07	5	9.84E-08					
Total	4.91E-05	9	5.46E-06					

TUKEY HSD/KRAMER — alpha 0.05

group	*mean*	*n*	*ss*	*df*	*q-crit*
1	0.006222	2	1.16E-07		
2	0.009567	2	5.37E-08		
3	0.009995	2	1.8E-08		
4	0.010219	2	1.57E-08		
6	0.004845	2	2.88E-07		
		10	4.92E-07	5	5.673

Q TEST

group 1	*group 2*	*mean*	*std err*	*q-stat*	*lower*	*upper*	*p-value*	*mean-crit*	*Cohen d*
1	2	0.003345	0.000222	15.07958	0.002086	0.004603	0.000686	0.001258	10.66288
1	3	0.003773	0.000222	17.01203	0.002515	0.005032	0.000384	0.001258	12.02932
1	4	0.003997	0.000222	18.01954	0.002739	0.005255	0.000291	0.001258	12.74174
1	6	0.001377	0.000222	6.206073	0.000118	0.002635	0.035456	0.001258	4.388357
2	3	0.000429	0.000222	1.93245	-0.00083	0.001687	0.669923	0.001258	1.366449
2	4	0.000652	0.000222	2.939953	-0.00061	0.00191	0.351205	0.001258	2.078861
2	6	0.004721	0.000222	21.28566	0.003463	0.00598	0.000129	0.001258	15.05123
3	4	0.000223	0.000222	1.007503	-0.00103	0.001482	0.94483	0.001258	0.712412
3	6	0.00515	0.000222	23.21811	0.003892	0.006408	8.41E-05	0.001258	16.41768
4	6	0.005373	0.000222	24.22561	0.004115	0.006632	6.79E-05	0.001258	17.13009

Table A.4.3: Full ANOVA and Tukey test of Coastal water Mg/Ca ratios

ANOVA: Single Factor

DESCRIPTION — Alpha 0.05

Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1	2	*12.4654*	*6.23271*	*0.1451*	*0.1451*	*0.27639*	*5.52223*	*6.9432*
2	2	10.80592	5.402958	0.046521	0.046521	0.27639	4.692474	6.113442
3	2	10.49343	5.246714	6.79E-06	6.79E-06	0.27639	4.53623	5.957198
4	2	10.11119	5.055594	0.002059	0.002059	0.27639	4.34511	5.766078
6	2	14.21912	7.109559	0.570233	0.570233	0.27639	6.399074	7.820043

ANOVA

Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	5.83928	4	1.45982	9.554842	0.014616	0.884311	2.185731	0.773855
Within Groups	0.763916	5	0.152783					
Total	6.603196	9	0.733688					

TUKEY HSD/KRAMER — alpha 0.05

group	*mean*	*n*	*ss*	*df*	*q-crit*
1	6.232712	2	0.145097		
2	5.402958	2	0.046521		
3	5.246714	2	6.79E-06		
4	5.055594	2	0.002059		
6	7.109559	2	0.570233		
		10	0.763916	5	5.673

Q TEST

group 1	*group 2*	*mean*	*std err*	*q-stat*	*lower*	*upper*	*p-value*	*mean-crit*	*Cohen d*
1	2	0.829754	0.27639	3.00211	-0.73821	2.397717	0.335962	1.567963	2.122812
1	3	0.985999	0.27639	3.567413	-0.58196	2.553961	0.22243	1.567963	2.522542
1	4	1.177119	0.27639	4.258899	-0.39084	2.745081	0.133849	1.567963	3.011496
1	6	0.876846	0.27639	3.172491	-0.69112	2.444809	0.2971	1.567963	2.24329
2	3	0.156244	0.27639	0.565303	-1.41172	1.724207	0.992894	1.567963	0.39973
2	4	0.347364	0.27639	1.256789	-1.2206	1.915327	0.889928	1.567963	0.888684
2	6	1.7066	0.27639	6.174601	0.138638	3.274563	0.036167	1.567963	4.366102
3	4	0.19112	0.27639	0.691486	-1.37684	1.759083	0.985051	1.567963	0.488955
3	6	1.862845	0.27639	6.739904	0.294882	3.430807	0.025529	1.567963	4.765832
4	6	2.053965	0.27639	7.431391	0.486002	3.621927	0.017068	1.567963	5.254787

Table A.4.4: All [Mg^{2+}], [Ca^{2+}], and Mg/Ca values of biomineralization experiment from titrations.

Treatment	Count	Divalent ion concentration (M)	[Mg^{2+}] (M)	[Ca^{2+}] (M)	Mg/Ca	Residual (Difference of measured from expected)
1.5	1	0.027036	0.016139	0.010898	1.480943	-0.01906
1.5	2	0.027146	0.016646	0.0105	1.585284	0.085284
1.5	3	0.026527	0.015892	0.010636	1.494198	-0.0058
1.5	4	0.026443	0.015818	0.010626	1.488646	-0.01135
1.5	5	0.026174	0.016475	0.0097	1.698474	0.198474
1.5	6	0.025923	0.016382	0.009541	1.717004	0.217004
1.5	7	0.027587	0.016934	0.010653	1.589665	0.089665
1.5	8	0.026492	0.015865	0.010627	1.492829	-0.00717
2.5	1	0.037059	0.026307	0.010752	2.446803	-0.0532
2.5	2	0.037022	0.026877	0.010145	2.649279	0.149279
2.5	3	0.036758	0.026441	0.010317	2.562726	0.062726
2.5	4	0.03677	0.02647	0.010301	2.569685	0.069685
3.5	1	0.048328	0.037224	0.011103	3.352467	-0.14753
3.5	2	0.048421	0.037779	0.010642	3.549848	0.049848
3.5	3	0.047409	0.037285	0.010124	3.682772	0.182772
3.5	4	0.047397	0.036816	0.010581	3.479299	-0.0207
4.5	1	0.065818	0.053956	0.011862	4.548474	0.048474
4.5	2	0.065458	0.053332	0.012126	4.397977	-0.10202
4.5	3	0.065886	0.053678	0.012208	4.396924	-0.10308
4.5	4	0.065822	0.053835	0.011988	4.490822	-0.00918
5.3	1	0.063176	0.053258	0.009918	5.369957	0.069957
5.3	2	0.064024	0.053821	0.010203	5.274935	-0.02506
5.3	3	0.066519	0.056209	0.01031	5.451997	0.151997
5.3	4	0.066426	0.055708	0.010718	5.197447	-0.10255

Table A.4.5: Single factor ANOVA and full Tukey test of Mg concentrations in biomineralization experiment, indicating that all treatments were statistically different from one another in Mg concentration, except treatment 4.5 compared to treatment 5.3.

ANOVA: Single Factor

DESCRIPTION — Alpha 0.05

Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	8	0.130149	0.016269	1.67E-07	1.17E-06	0.000232	0.015783	0.016754
2.5	4	0.106095	0.026524	6.04E-08	1.81E-07	0.000328	0.025837	0.02721
3.5	4	0.149103	0.037276	1.56E-07	4.67E-07	0.000328	0.03659	0.037962
4.5	4	0.2148	0.0537	7.32E-08	2.2E-07	0.000328	0.053014	0.054386
5.3	4	0.218996	0.054749	2.05E-06	6.14E-06	0.000328	0.054063	0.055435

ANOVA

Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.006056	4	0.001514	3520.596	5.63E-27	0.998653	25.64291	0.998298
Within Groups	8.17E-06	19	4.3E-07					
Total	0.006064	23	0.000264					

TUKEY HSD/KRAMER — alpha 0.05

group	*mean*	*n*	*ss*	*df*	*q-crit*
1.5	0.016269	8	1.17E-06		
2.5	0.026524	4	1.81E-07		
3.5	0.037276	4	4.67E-07		
4.5	0.0537	4	2.2E-07		
5.3	0.054749	4	6.14E-06		
		24	8.17E-06	19	4.253

Q TEST

group 1	*group 2*	*mean*	*std err*	*q-stat*	*lower*	*upper*	*p-value*	*mean-crit*	*Cohen d*
1.5	2.5	0.010255	0.000284	36.11519	0.009047	0.011463	1.23E-14	0.001208	15.63834
1.5	3.5	0.021007	0.000284	73.98119	0.019799	0.022215	9.21E-15	0.001208	32.0348
1.5	4.5	0.037431	0.000284	131.8223	0.036224	0.038639	9.1E-15	0.001208	57.08073
1.5	5.3	0.03848	0.000284	135.5167	0.037273	0.039688	9.1E-15	0.001208	58.68046
2.5	3.5	0.010752	0.000328	32.79291	0.009358	0.012147	2.73E-14	0.001394	16.39646
2.5	4.5	0.027176	0.000328	82.88478	0.025782	0.028571	9.21E-15	0.001394	41.44239
2.5	5.3	0.028225	0.000328	86.08425	0.026831	0.02962	9.21E-15	0.001394	43.04213
3.5	4.5	0.016424	0.000328	50.09186	0.01503	0.017819	9.33E-15	0.001394	25.04593
3.5	5.3	0.017473	0.000328	53.29134	0.016079	0.018868	9.33E-15	0.001394	26.64567
4.5	5.3	0.001049	0.000328	3.199472	-0.00035	0.002444	0.200226	0.001394	1.599736

Table A.4.6: Single factor ANOVA and full Tukey test of Ca concentrations in biomineralization experiment, indicating that Ca concentration in treatment 4.5 was statistically different from treatments 1.5, 2.5 3.5 and 5.3.

ANOVA: Single Factor

DESCRIPTION Alpha 0.05

Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	8	0.083179	0.010397	2.44E-07	1.71E-06	0.000136	0.010114	0.010681
2.5	4	0.041515	0.010379	6.79E-08	2.04E-07	0.000192	0.009978	0.01078
3.5	4	0.042451	0.010613	1.6E-07	4.81E-07	0.000192	0.010212	0.011014
4.5	4	0.048184	0.012046	2.33E-08	6.98E-08	0.000192	0.011645	0.012447
5.3	4	0.041149	0.010287	1.1E-07	3.3E-07	0.000192	0.009886	0.010688

ANOVA

Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	9.1E-06	4	2.28E-06	15.48201	8.68E-06	0.765224	1.923478	0.70706
Within Groups	2.79E-06	19	1.47E-07					
Total	1.19E-05	23	5.17E-07					

TUKEY HSD/KRAMER alpha 0.05

group	*mean*	*n*	*ss*	*df*	*q-crit*
1.5	0.010397	8	1.71E-06		
2.5	0.010379	4	2.04E-07		
3.5	0.010613	4	4.81E-07		
4.5	0.012046	4	6.98E-08		
5.3	0.010287	4	3.3E-07		
		24	2.79E-06	19	4.253

Q TEST

group 1	*group 2*	*mean*	*std err*	*q-stat*	*lower*	*upper*	*p-value*	*mean-crit*	*Cohen d*
1.5	2.5	1.87E-05	0.000166	0.112726	-0.00069	0.000725	0.99999	0.000706	0.048812
1.5	3.5	0.000215	0.000166	1.297563	-0.00049	0.000921	0.886634	0.000706	0.561861
1.5	4.5	0.001649	0.000166	9.932051	0.000943	0.002355	9.87E-06	0.000706	4.300704
1.5	5.3	0.00011	0.000166	0.663648	-0.0006	0.000816	0.989256	0.000706	0.287368
2.5	3.5	0.000234	0.000192	1.221346	-0.00058	0.001049	0.906594	0.000815	0.610673
2.5	4.5	0.001667	0.000192	8.699032	0.000852	0.002483	5.77E-05	0.000815	4.349516
2.5	5.3	9.15E-05	0.000192	0.477112	-0.00072	0.000907	0.996956	0.000815	0.238556
3.5	4.5	0.001433	0.000192	7.477685	0.000618	0.002249	0.000361	0.000815	3.738843
3.5	5.3	0.000326	0.000192	1.698459	-0.00049	0.001141	0.750814	0.000815	0.849229
4.5	5.3	0.001759	0.000192	9.176144	0.000944	0.002574	2.88E-05	0.000815	4.588072

Table A.4.7: Single factor ANOVA of Mg/Ca residuals in biomineralization experiment.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	8	0.547044	0.06838	0.009281	0.064966	0.035944	-0.00685	0.143612
2.5	4	0.228493	0.057123	0.006951	0.020853	0.050832	-0.04927	0.163517
3.5	4	0.064386	0.016097	0.019016	0.057049	0.050832	-0.0903	0.12249
4.5	4	-0.1658	-0.04145	0.005532	0.016595	0.050832	-0.14784	0.064943
5.3	4	0.094336	0.023584	0.012306	0.036918	0.050832	-0.08281	0.129978
ANOVA	Mg/Ca residual							
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.035988	4	0.008997	0.870474	0.49966	0.154876	0.42337	-0.02206
Within Groups	0.196379	19	0.010336					
Total	0.232367	23	0.010103					

Table A.4.8: Single factor ANOVA of water temperature residuals in biomineralization experiment between each of the treatment groups.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
Treatment 1.5	6	2.1	0.35	2.195	10.975	0.652616	-0.98282	1.682819
Treatment 2.5	6	2.1	0.35	2.227	11.135	0.652616	-0.98282	1.682819
Treatment 3.5	6	2.6	0.433333	2.554667	12.77333	0.652616	-0.89949	1.766153
Treatment 4.5	6	2	0.333333	2.682667	13.41333	0.652616	-0.99949	1.666153
Treatment 5.3	6	2.2	0.366667	2.854667	14.27333	0.652616	-0.96615	1.699486
Ambient Seawater	6	2.2	0.366667	2.818667	14.09333	0.652616	-0.96615	1.699486
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.036667	5	0.007333	0.00287	0.999999	0.000478	0.02187	-0.16075
Within Groups	76.66333	30	2.555444					
Total	76.7	35	2.191429					

Table A.4.9: Single factor ANOVA of water pH in biomineralization experiment between each of the treatment groups.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
Treatment 1.5	6	48.96	8.16	0.00288	0.0144	0.024148	8.110682	8.209318
Treatment 2.5	6	49	8.166667	0.003067	0.015333	0.024148	8.117349	8.215984
Treatment 3.5	6	48.84	8.14	0.0022	0.011	0.024148	8.090682	8.189318
Treatment 4.5	6	48.92	8.153333	0.001747	0.008733	0.024148	8.104016	8.202651
Treatment 5.3	6	48.81	8.135	0.00699	0.03495	0.024148	8.085682	8.184318
Ambient Seawater	6	48.99	8.165	0.00411	0.02055	0.024148	8.115682	8.214318
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.005233	5	0.001047	0.299143	0.90947	0.047489	0.223287	-0.10784
Within Groups	0.104967	30	0.003499					
Total	0.1102	35	0.003149					

Table A.4.10: All [Mg^{2+}], [Ca^{2+}], Mg/Ca, and residual values of acclimatization experiment from titrations.

Treatment	Tank	Divalent Ion concentration	Mg concentration	Ca concentration	Mg/Ca Ratio	Residual
5.3	Ambient Seawater	0.07366	0.061903	0.011757	5.26537	-0.03463
5.3	1	0.069305	0.05789	0.011415	5.071505	-0.22849
5.3	2	0.067459	0.056346	0.011113	5.070347	-0.22965
5.3	3	0.06149	0.051696	0.009794	5.278502	-0.0215
5.3	Ambient Seawater	0.048051	0.040278	0.007773	5.181775	-0.11822
5.3	1	0.064868	0.054974	0.009894	5.556382	0.256382
5.3	2	0.051774	0.043357	0.008417	5.150866	-0.14913
5.3	3	0.067476	0.056938	0.010538	5.403369	0.103369
5.3	Ambient Seawater	0.043512	0.036292	0.00722	5.026378	-0.27362
5.3	1	0.064579	0.054539	0.01004	5.432012	0.132012
5.3	2	0.066457	0.056367	0.01009	5.586449	0.286449
5.3	3	0.067936	0.056936	0.011	5.176197	-0.1238
5.3	Ambient Seawater	0.065132	0.055244	0.009888	5.586685	0.286685
5.3	1	0.041559	0.035215	0.006343	5.55148	0.25148
5.3	2	0.04111	0.034813	0.006297	5.528792	0.228792
5.3	3	0.06626	0.0557	0.01056	5.274621	-0.02538
5.3	Ambient Seawater	0.056996	0.048513	0.008482	5.719262	0.419262
4.5	1	0.05037	0.041175	0.009195	4.478114	-0.02189
4.5	2	0.054457	0.044479	0.009978	4.457836	-0.04216
4.5	3	0.052717	0.043322	0.009395	4.611304	0.111304
5.3	Ambient Seawater	0.062088	0.052691	0.009397	5.607165	0.307165
4.5	1	0.058489	0.047985	0.010504	4.568207	0.068207
4.5	2	0.055193	0.045231	0.009962	4.540175	0.040175
4.5	3	0.058018	0.047769	0.010248	4.661183	0.161183
5.3	Ambient Seawater	0.062558	0.053109	0.009449	5.620453	0.320453
4.5	1	0.054986	0.044848	0.010138	4.423551	-0.07645
4.5	2	0.06196	0.051104	0.010856	4.707472	0.207472
4.5	3	0.06117	0.050389	0.010781	4.673778	0.173778
5.3	Ambient Seawater	0.067248	0.057205	0.010044	5.695617	0.395617
3.5	1	0.047398	0.036885	0.010513	3.50846	0.00846
3.5	2	0.047398	0.036885	0.010513	3.50846	0.00846
3.5	3	0.047398	0.036885	0.010513	3.50846	0.00846
5.3	Ambient Seawater	0.058759	0.049008	0.00975	5.026365	-0.27363
3.5	1	0.043549	0.034021	0.009528	3.570612	0.070612
3.5	2	0.048898	0.038632	0.010266	3.762932	0.262932
3.5	3	0.048522	0.037736	0.010785	3.498921	-0.00108
5.3	Ambient Seawater	0.06067	0.050736	0.009934	5.107291	-0.19271
3.5	1	0.047638	0.037398	0.010239	3.652443	0.152443
3.5	2	0.043262	0.033527	0.009735	3.444128	-0.05587

3.5	3	0.049663	0.038961	0.010702	3.640672	0.140672
5.3	Ambient Seawater	0.066445	0.0559	0.010545	5.301342	0.001342
2.5	1	0.036872	0.026336	0.010536	2.499583	-0.00042
2.5	2	0.036872	0.026336	0.010536	2.499583	-0.00042
2.5	3	0.036872	0.026336	0.010536	2.499583	-0.00042
5.3	Ambient Seawater	0.066445	0.0559	0.010545	5.301342	0.001342
2.5	1	0.036895	0.026336	0.010559	2.494149	-0.00585
2.5	2	0.036895	0.026336	0.010559	2.494149	-0.00585
2.5	3	0.036895	0.026336	0.010559	2.494149	-0.00585
5.3	Ambient Seawater	0.065181	0.054946	0.010235	5.36868	0.06868
2.5	1	0.037074	0.026416	0.010657	2.478668	-0.02133
2.5	2	0.03704	0.026592	0.010448	2.545101	0.045101
2.5	3	0.036764	0.026455	0.010309	2.566203	0.066203
5.3	Ambient Seawater	0.062696	0.052852	0.009844	5.36868	0.06868
1.5	1	0.026545	0.016236	0.010309	1.57494	0.07494
1.5	2	0.027971	0.017161	0.010809	1.587618	0.087618
1.5	3	0.026639	0.016098	0.010541	1.527235	0.027235
5.3	Ambient Seawater	0.063176	0.053258	0.009918	5.369957	0.069957
1.5	1	0.027036	0.016139	0.010898	1.480943	-0.01906
1.5	2	0.026527	0.015892	0.010636	1.494198	-0.0058
1.5	3	0.026443	0.015818	0.010626	1.488646	-0.01135
5.3	Ambient Seawater	0.064024	0.053821	0.010203	5.274935	-0.02506
1.5	1	0.027587	0.016934	0.010653	1.589665	0.089665
1.5	2	0.026492	0.015865	0.010627	1.492829	-0.00717
1.5	3	0.025742	0.015746	0.009996	1.575153	0.075153

Table A.4.11: Five single factor ANOVA tests of water Mg/Ca values in acclimatization experiment for each phase of treatment.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
5.3 Phase	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Day 1	3	15.42035	5.140118	0.014363	0.028726	0.101185	4.906786	5.37345
Day 14	3	16.11062	5.370206	0.041936	0.083871	0.101185	5.136873	5.603538
Day 27	3	16.19466	5.39822	0.042933	0.085866	0.101185	5.164887	5.631552
Day 40	3	16.35489	5.451631	0.023628	0.047256	0.101185	5.218299	5.684964
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
5.3 Phase	0.170149	3	0.056716	1.84653	0.216956	0.40914	0.784544	0.174667
Tanks in 5.3	0.24572	8	0.030715					
Total	0.415869	11	0.037806					
DESCRIPTION					Alpha	0.05		
4.5 Phase	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Day 1	3	13.54725	4.515751	0.006951	0.013901	0.062381	4.363109	4.668393
Day 20	3	13.76957	4.589855	0.004012	0.008024	0.062381	4.437214	4.742497
Day 40	3	13.8048	4.6016	0.02406	0.04812	0.062381	4.448959	4.754242
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
4.5 Phase	0.012999	2	0.0065	0.556756	0.600069	0.156535	0.430796	-0.10926
Tanks in 4.5	0.070046	6	0.011674					
Total	0.083045	8	0.010381					
DESCRIPTION					Alpha	0.05		
3.5 Phase	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Day 1	3	10.52538	3.50846	0	0	0.059937	3.361799	3.65512
Day 20	3	10.83246	3.610821	0.018638	0.037276	0.059937	3.464161	3.757482
Day 40	3	10.73724	3.579081	0.013694	0.027388	0.059937	3.432421	3.725741
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
3.5 Phase	0.016473	2	0.008236	0.764237	0.506213	0.203026	0.504723	-0.05529
Tanks in 3.5	0.064664	6	0.010777					
Total	0.081137	8	0.010142					
DESCRIPTION					Alpha	0.05		
2.5 Phase	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Day 1	3	7.498748	2.499583	0	0	0.015227	2.462323	2.536842
Day 20	3	7.482446	2.494149	0	0	0.015227	2.456889	2.531409
Day 40	3	7.589972	2.529991	0.002087	0.004174	0.015227	2.492731	2.567251
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
2.5 Phase	0.002239	2	0.001119	1.609241	0.275725	0.349134	0.732403	0.119243
Tanks in 2.5	0.004174	6	0.000696					
Total	0.006413	8	0.000802					

DESCRIPTION					Alpha	0.05		
1.5 Phase	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Day 1	3	4.689794	1.563265	0.001014	0.002028	0.020509	1.513081	1.613449
Day 20	3	4.463787	1.487929	4.43E-05	8.86E-05	0.020509	1.437745	1.538113
Day 40	3	4.657648	1.552549	0.002728	0.005455	0.020509	1.502365	1.602733
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
1.5 Phase	0.009966	2	0.004983	3.9489	0.080467	0.568277	1.147301	0.395884
Tanks in 1.5	0.007571	6	0.001262					
Total	0.017537	8	0.002192					

Table A.4.12: A single factor ANOVA test and full Tukey test of Mg/Ca between treatment phases of acclimatization experiment, indicating that all treatments were statistically different from one another in Mg/Ca ratio.

ANOVA: Single Factor

DESCRIPTION — Alpha 0.05

Treatment	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
5.3	12	64.08052	5.340044	0.037806	0.415869	0.034213	5.271046	5.409041
4.5	9	41.12162	4.569069	0.010381	0.083045	0.039506	4.489398	4.64874
3.5	9	32.09509	3.566121	0.010142	0.081137	0.039506	3.486449	3.645792
2.5	9	22.57117	2.507907	0.000802	0.006413	0.039506	2.428236	2.587579
1.5	9	13.81123	1.534581	0.002192	0.017537	0.039506	1.45491	1.614252

ANOVA

Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Ω^2
Between Treatments	93.90669	4	23.47667	1671.352	1.48E-46	0.993609	12.9208	0.992867
Within Groups	0.604	43	0.014047					
Total	94.51069	47	2.010866					

TUKEY HSD/KRAMER — alpha 0.05

group	mean	n	ss	df	q-crit
5.3	5.340044	12	0.415869		
4.5	4.569069	9	0.083045		
3.5	3.566121	9	0.081137		
2.5	2.507907	9	0.006413		
1.5	1.534581	9	0.017537		
		48	0.604	43	4.026023

Q TEST

group 1	group 2	mean	std err	q-stat	lower	upper	p-value	mean-crit	Cohen d
5.3	4.5	0.770975	0.036954	20.86282	0.622195	0.919754	5.22E-15	0.14878	6.505128
5.3	3.5	1.773923	0.036954	48.00292	1.625143	1.922703	5.22E-15	0.14878	14.96754
5.3	2.5	2.832136	0.036954	76.63851	2.683357	2.980916	5.22E-15	0.14878	23.89626
5.3	1.5	3.805463	0.036954	102.977	3.656683	3.954242	5.22E-15	0.14878	32.10873
4.5	3.5	1.002948	0.039506	25.38724	0.843896	1.162	5.22E-15	0.159052	8.462413
4.5	2.5	2.061162	0.039506	52.17338	1.90211	2.220214	5.22E-15	0.159052	17.39113
4.5	1.5	3.034488	0.039506	76.81081	2.875436	3.19354	5.22E-15	0.159052	25.6036
3.5	2.5	1.058213	0.039506	26.78614	0.899161	1.217265	5.22E-15	0.159052	8.928714
3.5	1.5	2.03154	0.039506	51.42357	1.872488	2.190592	5.22E-15	0.159052	17.14119
2.5	1.5	0.973326	0.039506	24.63743	0.814274	1.132378	5.22E-15	0.159052	8.212476

Table A.4.13: Individual DO measurements of acclimatization experiment tanks.

DO (ppm)				
Day	**Control**	**Tank 1**	**Tank 2**	**Tank 3**
0	7.26	6.64	6.75	6.75
2	7.14	7.19	7.19	7.17
5	7.31	7.68	7.49	7.47
6	7.31	7.37	7.21	7.27
9	7.49	7.23	7.32	7.22
9	7.34	7.12	7.24	7.26
13	7.44	7.28	7.10	7.31
15	7.15	7.01	7.45	7.15
19	7.29	7.05	7.13	6.83
23	7.46	7.35	7.28	7.6
26	7.19	6.89	7.06	7.15
30	7.14	6.74	7.38	7.18
35	7.35	7.41	7.42	7.34
40	7.02	6.71	6.78	7.3
43	7.02	7.22	6.97	6.59
48	7.08	6.98	6.98	6.93
50	6.81	7.04	7.01	7.00
55	7.01	7.03	6.99	7.00
58	6.98	6.83	7.02	7.03
63	7.03	6.76	6.98	6.59
65	6.89	6.96	7.04	7.21
75	7.00	6.47	6.76	6.79
78	7.00	7.13	7.06	7.18
83	6.83	6.81	6.82	6.96
84	7.10	7.04	7.22	7.23
89	6.78	6.83	6.86	6.90
93	6.70	7.00	7.02	7.05
97	6.83	6.68	6.59	6.33
100	7.17	7.01	7.07	7.3
105	6.46	6.61	6.33	6.31
156	7.97	9.41	8.82	8.60
160	9.07	8.82	9.34	9.41
167	8.44	8.32	9.07	9.00
174	9.88	9.48	9.61	10.06
176	9.39	9.86	9.77	9.80
181	9.36	9.35	8.91	9.26
189	9.74	9.34	9.44	9.63
195	8.93	7.98	9.6	9.64
203	9.58	9.46	9.35	9.59
209	9.45	8.17	9.04	9.35

Table A.4.14: Individual pH measurements of acclimatization experiment tanks.

pH				
Day	**Control**	**Tank 1**	**Tank 2**	**Tank 3**
0	8.27	8.20	8.23	8.23
2	8.30	8.26	8.28	8.27
5	8.24	8.21	8.23	8.25
6	8.22	8.23	8.24	8.27
9	8.18	8.23	8.24	8.26
9	8.28	8.12	8.15	8.16
13	8.30	8.22	8.29	8.28
15	8.30	8.25	8.27	8.26
19	8.20	8.12	8.21	8.20
23	8.02	8.04	8.08	8.08
26	8.00	8.02	8.07	8.02
30	8.21	8.22	8.21	8.24
35	8.27	8.26	8.24	8.28
40	8.21	8.25	8.26	8.28
43	8.20	8.25	8.19	8.18
48	8.16	8.16	8.16	8.15
55	8.16	8.21	8.25	8.25
63	8.09	8.06	8.06	8.06
65	8.12	8.09	8.08	8.08
75	8.13	8.09	8.13	8.14
78	8.11	8.09	8.10	8.10
83	8.11	8.09	8.07	8.08
84	8.18	8.19	8.21	8.18
89	8.13	8.14	8.16	8.18
93	8.13	8.13	8.13	8.12
97	8.07	8.07	8.08	8.09
100	8.19	8.18	8.22	8.19
105	8.18	8.14	8.14	8.13
107	8.05	8.03	8.03	8.03
112	8.10	8.09	8.09	8.13
117	7.99	7.89	8.00	7.98
128	8.20	8.19	8.19	8.21
146	8.20	8.21	8.22	8.17
156	8.11	8.09	8.03	8.05
160	7.98	8.17	8.00	7.99
167	8.01	8.10	8.11	8.07
168	8.14	8.17	8.17	8.17
174	8.02	8.06	8.08	8.08
176	8.00	8.04	8.03	8.03
181	8.03	8.07	8.06	8.07
189	7.99	8.03	8.07	8.05
195	8.08	8.10	8.11	8.09
203	8.02	8.03	8.04	8.04
209	7.98	8.01	8.03	8.00
Average	8.13	8.13	8.14	8.14
Std Dev	0.10	0.08	0.08	0.09

Table A.4.15: Individual temperature measurements of acclimatization experiment tanks.

	Temperature (°C)			
Day	**Control**	**Tank 1**	**Tank 2**	**Tank 3**
0	10.9	11.0	11.2	11.2
2	9.8	10.2	10.3	10.3
5	8.2	8.4	8.5	8.4
6	9.8	9.9	9.9	9.8
9	9.2	9.8	9.7	9.8
13	8.7	8.6	8.8	8.7
15	9.9	9.9	10.0	9.9
19	10.4	10.3	10.3	10.3
23	8.6	8.6	8.7	8.6
26	9.9	10.0	10.0	10.0
30	9.4	9.4	9.6	9.6
35	9.5	9.4	9.4	9.4
40	9.4	9.3	9.2	9.3
43	8.4	9.1	9.2	9.0
48	9.6	9.6	9.6	9.6
50	10.5	10.3	10.4	10.4
55	11.5	11.3	11.4	11.3
58	11.1	11.0	11.0	11.0
63	11.0	10.8	10.9	10.8
65	9.7	9.4	9.4	9.4
75	11.8	11.5	11.5	11.5
78	10.8	10.5	10.6	10.5
83	12.5	12.4	12.3	12.3
84	10.0	10.8	10.6	10.6
89	12.5	12.3	12.4	12.3
93	11.9	11.7	11.7	11.6
97	12.7	12.7	12.7	12.7
100	11.3	11.4	11.4	11.1
105	14.0	13.9	14.2	13.9
107	13.9	13.8	13.9	13.8
112	8.0	8.0	8.1	8.0
117	13.4	13.7	13.8	13.7
121	11.0	10.9	11.0	10.9
124	12.6	12.8	12.8	12.7
128	10.0	10.2	10.1	10.1
142	13.2	13.3	13.2	13.1
146	14.1	14.0	13.8	13.9
156	15.5	15.4	15.6	15.4
160	16.0	15.8	16.0	15.9
167	13.8	13.8	13.7	13.6
174	13.9	14.0	13.8	13.8
176	14.9	15.0	14.8	14.7
181	15.6	15.7	15.5	15.6
189	15.8	15.9	15.8	15.8
195	15.3	15.4	15.4	15.3
203	15.4	15.4	15.3	15.3
209	14.9	15.4	15.3	15.0

Table A.4.16: Individual survival data of acclimatization experiment tanks.

	Survival Counts			
Day	**Control**	**Tank 1**	**Tank 2**	**Tank 3**
0	11	11	11	11
2	11	11	11	11
5	11	11	11	11
6	11	11	11	11
9	11	11	11	11
13	11	11	11	11
15	11	11	11	11
19	11	11	11	11
23	11	11	11	11
26	11	11	11	11
30	11	11	11	11
35	11	11	11	11
40	11	11	11	11
43	11	11	11	11
48	11	11	11	11
50	11	11	11	11
55	11	11	11	11
58	11	11	11	11
63	11	11	11	11
65	11	11	11	11
75	11	11	11	11
78	11	11	11	11
83	11	11	11	11
89	11	11	11	11
93	11	11	11	11
97	11	11	11	11
100	11	11	11	11
105	11	11	11	11
107	11	11	11	11
112	11	11	11	11
117	11	11	11	11
121	11	11	11	11
124	11	11	11	11
125	11	11	11	11
128	11	11	11	11
131	11	11	11	11
138	11	11	11	11
142	11	11	11	11
146	11	11	11	11
147	11	11	11	11
150	11	10	11	11
160	11	10	11	11
167	11	10	11	11
168	11	10	11	11
174	11	10	11	11
176	11	10	11	11
181	11	10	11	11
189	11	10	11	11
195	11	10	11	11
203	11	10	11	11
209	11	10	11	11

Table A.4.17: A single factor ANOVA test of the shell length growth rate oyster between treatment phases of biomineralization experiment, indicating that no treatments were statistically different from one another in growth rate.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
0	15	0.180833	0.012056	0.000504	0.007054	0.005555	0.00101	0.023101
0.02	15	0.288966	0.019264	0.000658	0.009211	0.005555	0.008218	0.03031
0	15	0.22	0.014667	0.000427	0.005973	0.005555	0.003621	0.025713
0.020833	15	0.240833	0.016056	0.000469	0.006567	0.005555	0.00501	0.027101
0.02	15	0.2	0.013333	0.000438	0.006133	0.005555	0.002287	0.024379
0	15	0.181667	0.012111	0.000281	0.003936	0.005555	0.001065	0.023157
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.000572	5	0.000114	0.247302	0.940067	0.014507	0.128401	-0.04364
Within Groups	0.038875	84	0.000463					
Total	0.039448	89	0.000443					

Table A.4.18: A single factor ANOVA test of the shell width growth rate of oysters between treatment phases of biomineralization experiment, indicating that no treatments were statistically different from one another in growth rate.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	16	0.487098	0.030444	0.001084	0.016253	0.006596	0.01734	0.043547
2.5	16	0.368966	0.02306	0.000523	0.007848	0.006596	0.009957	0.036164
3.5	16	0.58	0.03625	0.000918	0.013775	0.006596	0.023147	0.049353
4.5	16	0.4625	0.028906	0.000209	0.003133	0.006596	0.015803	0.042009
5.3	16	0.32	0.02	0.000427	0.0064	0.006596	0.006897	0.033103
Ambient Seawater	16	0.538649	0.033666	0.001016	0.015234	0.006596	0.020562	0.046769
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.003076	5	0.000615	0.883814	0.495394	0.046803	0.235029	-0.00609
Within Groups	0.062642	90	0.000696					
Total	0.065718	95	0.000692					

Table A.4.19: A single factor ANOVA test of the shell length growth rate of mussels between treatment phases of biomineralization experiment, indicating that no treatments were statistically different from one another in growth rate.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	23	0.846695	0.036813	0.000669	0.014715	0.005574	0.02579	0.047835
2.5	24	0.790345	0.032931	0.000478	0.010987	0.005456	0.022141	0.043721
3.5	24	0.78	0.0325	0.000828	0.01905	0.005456	0.02171	0.04329
4.5	24	0.7025	0.029271	0.001148	0.026407	0.005456	0.018481	0.040061
5.3	24	0.9	0.0375	0.000707	0.01625	0.005456	0.02671	0.04829
Ambient Seawater	23	0.796149	0.034615	0.000444	0.009766	0.005574	0.023593	0.045638
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.001102	5	0.00022	0.3084	0.907211	0.011211	0.11381	-0.02496
Within Groups	0.097176	136	0.000715					
Total	0.098277	141	0.000697					

Table A.4.20: A single factor ANOVA test of the shell width growth rate of mussels between treatment phases of biomineralization experiment, indicating that no treatments were statistically different from one another in growth rate.

ANOVA: Single Factor								
DESCRIPTION					Alpha	0.05		
Group	*Count*	*Sum*	*Mean*	*Variance*	*SS*	*Std Err*	*Lower*	*Upper*
1.5	23	1.02046	0.044368	0.000461	0.010138	0.005836	0.032826	0.055909
2.5	24	0.875862	0.036494	0.00048	0.011039	0.005713	0.025196	0.047793
3.5	24	1.12	0.046667	0.001693	0.038933	0.005713	0.035368	0.057965
4.5	24	0.733132	0.030547	0.000412	0.009467	0.005713	0.019249	0.041846
5.3	24	0.88	0.036667	0.000441	0.010133	0.005713	0.025368	0.047965
Ambient Seawater	23	0.943764	0.041033	0.00122	0.026832	0.005836	0.029492	0.052575
ANOVA								
Sources	*SS*	*df*	*MS*	*F*	*P value*	*Eta-sq*	*RMSSE*	Ω^2
Between Groups	0.004156	5	0.000831	1.060974	0.384866	0.037542	0.210989	0.002142
Within Groups	0.106544	136	0.000783					
Total	0.1107	141	0.000785					

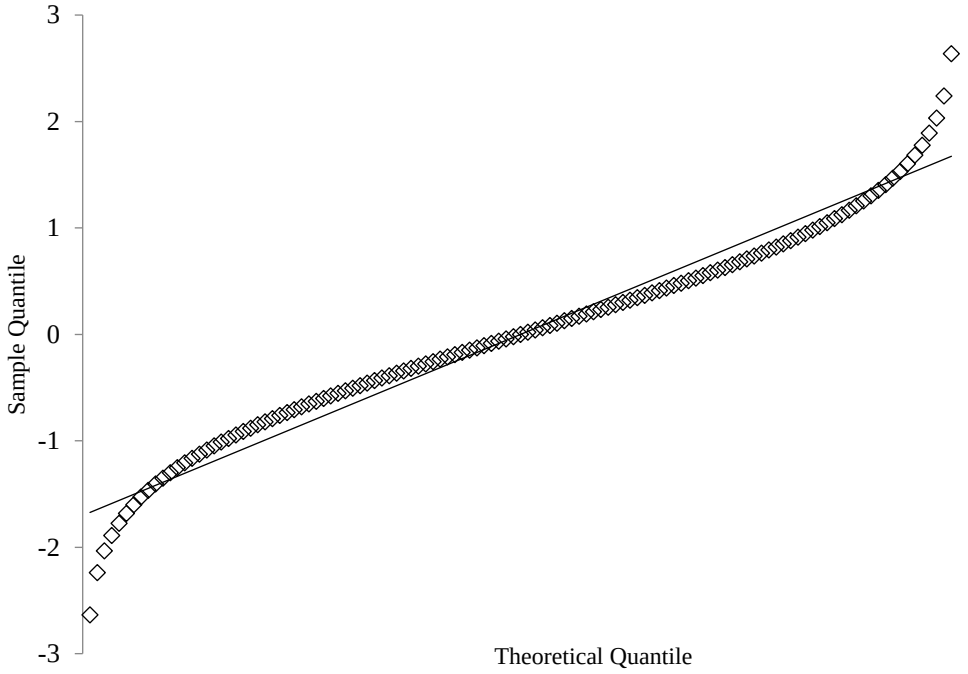

Fig. A.4.1: QQ plot showing a normal distribution of data for Mg content in mussel calcite.

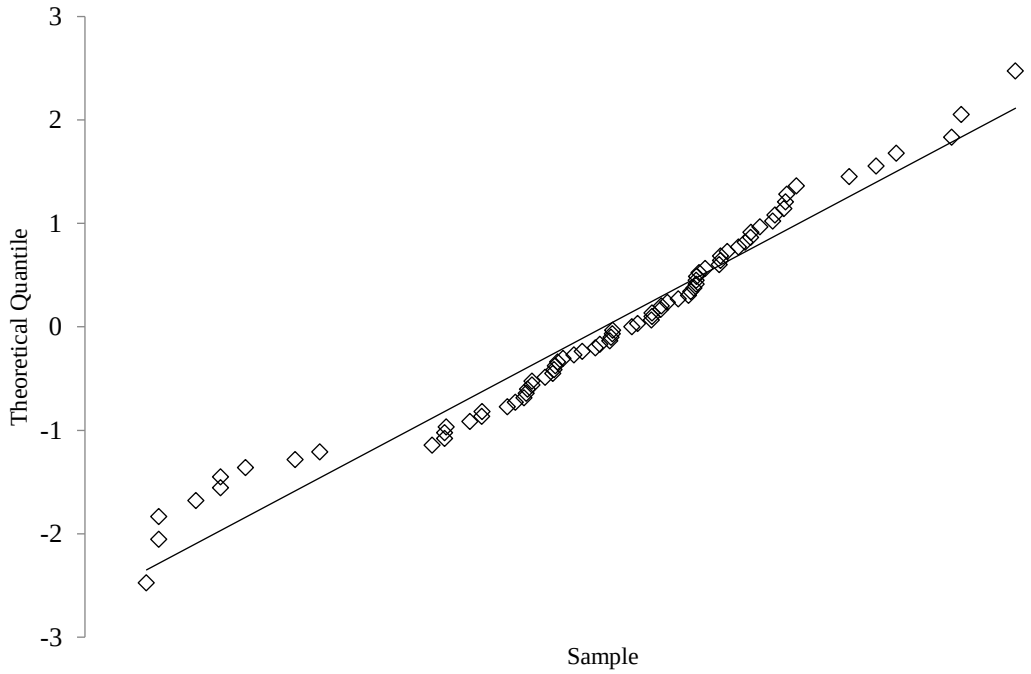

Fig. A.4.2: QQ plot showing samples plotted against normalized standard deviations showing a normal distribution of data for Mg content in oysters.

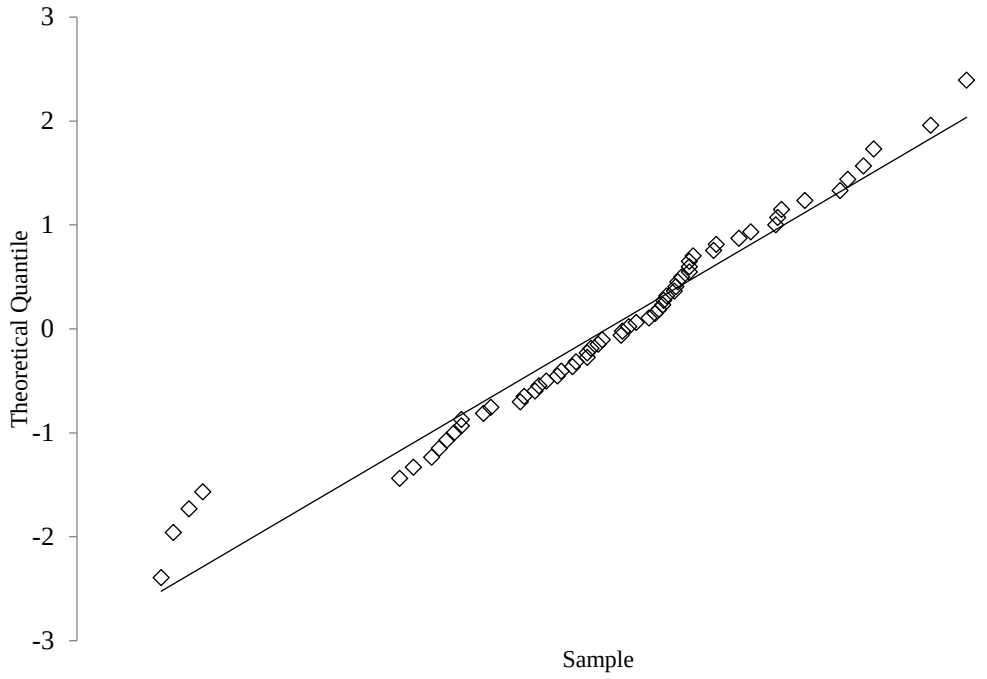

Fig. A.4.3: QQ plot showing samples plotted against normalized standard deviations showing a normal distribution of data for Mg content in tubeworm.

Table A.4.21: Mussel calcite data. Values of wt%$MgCO_3$ in each of up to two calcites identified, the % of each type of calcite in the sample tested (determined by the peak ratio), the overall Mg content of the sample, and the skeletal Mg/Ca value calculated from the equation Mg:Ca = (10,010 9 wt% MgCO3)/ (843,000–8,430 9 wt% Mg CO3).

Treatment	Tank	Wt% Mg in C	Wt% Mg in LMC	Peak Ratio	%C	%LMC	Mg Content	Skeletal Mg/Ca
1.5	1A	1.32	4.17	0	68.63368	31.36632	2.21394	0.026884
1.5	1A	0.48	3.09	0.33616333	63.87164	36.12836	1.42295	0.01714
1.5	1A		1.65	0	0	100	1.65	0.019921
1.5	1A	0.93		0.31549961	100	0	0.93	0.011147
1.5	1A	0.12	2.58	0.34184745	61.72116	38.27884	1.061659	0.012742
1.5	1A		1.5	0	0	100	1.5	0.018083
1.5	1B	0.87	3.3	0.36175857	60.21577	39.78423	1.836757	0.022218
1.5	1B	0		0.35128652	100	0	0	0
1.5	1B	0.12		0	100	0	0.12	0.001427
1.5	1B	0.21		0	100	0	0.21	0.002499
1.5	1B	0		0.51186047	100	0	0	0
1.5	1B	0.24	2.73	0.54494224	62.83671	37.16329	1.165366	0.014001
1.5	1C	0.48	3	0	62.49001	37.50999	1.425252	0.017169
1.5	1C	1.17	3.63	0	63.47588	36.52412	2.068493	0.025081
1.5	1C	0.54		0	100	0	0.54	0.006447
1.5	1C		2.55	0.33893805	0	100	2.55	0.031072
1.5	1C	0.69	2.49	0.33632863	58.02174	41.97826	1.445609	0.017417
1.5	1C	0.27	2.82	0.33431759	64.51056	35.48944	1.174981	0.014118
1.5	1D	0.42		0.34642326	100	0	0.42	0.005008
1.5	1D	0.6	2.79	0	62.97009	37.02991	1.410955	0.016994
1.5	1D	0.264	2.82	0.32201471	62.93339	37.06661	1.211422	0.014561
1.5	1D	0.48	2.85	0.3516906	63.40113	36.59887	1.347393	0.016218
1.5	1D	0.36	2.67	0.38390827	61.05427	38.94573	1.259646	0.015148
1.5	1D	0	2.31	0.34382315	61.55242	38.44758	0.888139	0.01064
2.5	2A	0	2.58	0	61.22154	38.77846	1.000484	0.012
2.5	2A	0.06	2.61	0	65.69584	34.30416	0.934756	0.011204
2.5	2A	0.09	2.16	0.35800757	63.99103	36.00897	0.835386	0.010003
2.5	2A	0.57		0.34692365	100	0	0.57	0.006807
2.5	2A	0.51	2.85	0.34315226	61.56809	38.43191	1.409307	0.016974
2.5	2A	0.27		0.37993449	100	0	0.27	0.003215
2.5	2B	0.36	2.97	0.33333333	61.5913	38.4087	1.362467	0.016402
2.5	2B	0.75	2.91	0	61.05331	38.94669	1.591248	0.0192
2.5	2B	0.57		0.43398916	100	0	0.57	0.006807
2.5	2B	0.51	3.18	0.33997188	67.80253	32.19747	1.369673	0.01649
2.5	2B	0.3	2.7	0.36627907	63.61778	36.38222	1.173173	0.014096
2.5	2B	0.87	3.81	0.34599608	66.53259	33.46741	1.853942	0.02243
2.5	2C	0.36	2.97	0.34494949	62.77381	37.22619	1.331604	0.016025
2.5	2C	0.78	3.6	0.33894081	65.94028	34.05972	1.740484	0.021033
2.5	2C	0.51	2.52	0.33616944	66.39024	33.60976	1.185556	0.014247
2.5	2C	0.69		0	100	0	0.69	0.00825
2.5	2C	0.57	2.91	0.35682531	61.0782	38.9218	1.48077	0.017847

2.5	2C	0.36		0.3580702	100	0	0.36	0.00429
2.5	2D	0.63	3.18	0.3713955	62.36604	37.63396	1.589666	0.019181
2.5	2D	0.36	2.49	0	59.84211	40.15789	1.215363	0.014609
2.5	2D	0	1.08	0.3640472	45.44988	54.55012	0.589141	0.007037
2.5	2D		1.5	0.35057126	0	100	1.5	0.018083
2.5	2D	0.42	2.88	0.35320931	62.90144	37.09856	1.332624	0.016038
2.5	2D	0.45	2.7	0.34920198	61.21903	38.78097	1.322572	0.015915
3.5	3A	0.45	3.18	0	65.05822	34.94178	1.40391	0.016908
3.5	3A	0.39		0.36319065	100	0	0.39	0.004649
3.5	3A	0.3	2.64	0.33287483	61.9389	38.0611	1.19063	0.014308
3.5	3A	0.3		0.3359162	100	0	0.3	0.003573
3.5	3A	0.57		0.36714751	100	0	0.57	0.006807
3.5	3A	0.39		0.36411584	100	0	0.39	0.004649
3.5	3B	0.27	2.58	0.36092912	61.30033	38.69967	1.163962	0.013984
3.5	3B	0.6		0.35248567	100	0	0.6	0.007168
3.5	3B	0.57	3.09	0.31431448	61.51625	38.48375	1.53979	0.01857
3.5	3B	0.33		0.33868844	100	0	0.33	0.003931
3.5	3B	0.15	2.55	0.34768803	64.24044	35.75956	1.008229	0.012094
3.5	3B	0.24		0.35111529	100	0	0.24	0.002857
3.5	3C	0.57	2.88	0.35632801	61.13093	38.86907	1.467876	0.01769
3.5	3C	0.48		0	100	0	0.48	0.005727
3.5	3C	0.54	2.76	0	61.60166	38.39834	1.392443	0.016768
3.5	3C	1.38	3.96	0.33362382	64.37355	35.62645	2.299162	0.027943
3.5	3C	0.48	2.79	0.34939759	59.10762	40.89238	1.424614	0.017161
3.5	3C	0.57		0.33634155	100	0	0.57	0.006807
3.5	3D	0.63		0.35960379	100	0	0.63	0.007528
3.5	3D	0.84	3.51	0.36162162	64.24204	35.75796	1.794738	0.021701
3.5	3D	0.48	2.58	0.36496703	60.01986	39.98014	1.319583	0.015879
3.5	3D	0.81		0.3294841	100	0	0.81	0.009697
3.5	3D	0.57	2.85	0.33153051	60.88249	39.11751	1.461879	0.017616
3.5	3D	0.48	3.06	0.36526725	61.57345	38.42655	1.471405	0.017733
4.5	4A		1.56	0	0	100	1.56	0.018817
4.5	4A	0.69	2.97	0.35740323	59.40223	40.59777	1.615629	0.019499
4.5	4A	0.42	3.12	0.3237844	66.28096	33.71904	1.330414	0.016011
4.5	4A	1.08	4.02	0.34418111	64.52239	35.47761	2.123042	0.025756
4.5	4A	0.39	2.58	0	58.77222	41.22778	1.292888	0.015553
4.5	4A	0.51	3.09	0.3437594	59.91466	40.08534	1.544202	0.018624
4.5	4B	0.51	3.33	0.35745494	67.03899	32.96101	1.439501	0.017343
4.5	4B	0.45	2.88	0.33305144	60.62533	39.37467	1.406805	0.016943
4.5	4B		1.44	0.34837438	0	100	1.44	0.017349
4.5	4B		1.29	0.35627667	0	100	1.29	0.015518
4.5	4B	0.54	2.88	0.35480573	61.1898	38.8102	1.448159	0.017448
4.5	4B	0.66	2.94	0.34916039	61.39204	38.60796	1.540261	0.018576
4.5	4C		1.56	0.3478769	0	100	1.56	0.018817
4.5	4C	0.45	2.94	0	63.88011	36.11989	1.349385	0.016242
4.5	4C	0.42	2.82	0.4911103	62.60441	37.39559	1.317494	0.015853
4.5	4C	0.15		0.3538262	100	0	0.15	0.001784
4.5	4C		3.09	0.36438679	0	100	3.09	0.037861

4.5	4C		8.61	0	0	100	8.61	0.111869
4.5	4D	0.69	3.09	0	61.87762	38.12238	1.604937	0.019368
4.5	4D	0.81		0.36942966	100	0	0.81	0.009697
4.5	4D	0.42		0	100	0	0.42	0.005008
4.5	4D	0.75	3.33	0.35056584	63.00348	36.99652	1.70451	0.020591
4.5	4D	0.24	2.73	0	61.50149	38.49851	1.198613	0.014405
4.5	4D	0.33	3.3	0.37078162	67.41271	32.58729	1.297843	0.015614
5.3	5A	0.27	2.43	0.355041	61.04297	38.95703	1.111472	0.013346
5.3	5A	0.6	2.64	0.35809121	60.57385	39.42615	1.404294	0.016912
5.3	5A	0.78	3.27	0.35936065	64.18838	35.81162	1.671709	0.020188
5.3	5A	0.48	3.33	0.36162591	63.14037	36.85963	1.530499	0.018456
5.3	5A	0.63	2.16	0.34529277	61.45318	38.54682	1.219766	0.014663
5.3	5A	0.09		0.37392337	100	0	0.09	0.00107
5.3	5B	0.54	2.97	0.35234242	65.84439	34.15561	1.369981	0.016493
5.3	5B	0.72	3.09	0.34697509	60.9484	39.0516	1.645523	0.019866
5.3	5B	0.42	2.91	0	60.0237	39.9763	1.41541	0.017048
5.3	5B	0.48	2.82	0.36006051	62.85334	37.14666	1.349232	0.01624
5.3	5B	0.48	3.21	0	67.62986	32.37014	1.363705	0.016417
5.3	5B	0.06		0.33395415	100	0	0.06	0.000713
5.3	5C	0.54	2.91	0	61.24145	38.75855	1.458578	0.017576
5.3	5C	0.54	3	0.35071489	61.47968	38.52032	1.4876	0.017931
5.3	5C	0.6		0.37813587	100	0	0.6	0.007168
5.3	5C	0.69	3.3	0	65.46211	34.53789	1.591439	0.019203
5.3	5C	0.54	2.91	0.35200091	61.76271	38.23729	1.446224	0.017425
5.3	5C	0.87	3.3	0.34838998	61.70426	38.29574	1.800587	0.021773
5.3	5D		1.35	0	0	100	1.35	0.01625
5.3	5D		1.08	0	0	100	1.08	0.012964
5.3	5D		1.26	0	0	100	1.26	0.015152
5.3	5D	0.69	2.97	0	60.55123	39.44877	1.589432	0.019178
5.3	5D	0.6		0	100	0	0.6	0.007168
5.3	5D	0.96		0.33607807	100	0	0.96	0.01151
Ambient Seawater	6A	0.24		0	100	0	0.24	0.002857
Ambient Seawater	6A	0.72		0.32762794	100	0	0.72	0.008611
Ambient Seawater	6A	0.39		0	100	0	0.39	0.004649
Ambient Seawater	6A	0.66		0	100	0	0.66	0.007889
Ambient Seawater	6A		1.14	0	0	100	1.14	0.013693
Ambient Seawater	6A		1.47	0	0	100	1.47	0.017716
Ambient Seawater	6B	0.33		0.35907606	100	0	0.33	0.003931
Ambient Seawater	6B	0.48	2.88	0.33151073	63.95189	36.04811	1.345155	0.016191
Ambient Seawater	6B		2.61	0.33462673	0	100	2.61	0.031822
Ambient Seawater	6B	0.78		0	100	0	0.78	0.009335
Ambient Seawater	6B	0.33		0.34336055	100	0	0.33	0.003931
Ambient Seawater	6B	0.51		0.34790966	100	0	0.51	0.006087
Ambient Seawater	6C	0.06		0	100	0	0.06	0.000713
Ambient Seawater	6C		1.11	0.35702798	0	100	1.11	0.013328
Ambient Seawater	6C	0.15		0.34280905	100	0	0.15	0.001784
Ambient Seawater	6C		1.8	0.51652995	0	100	1.8	0.021765
Ambient Seawater	6C	0.09		0	100	0	0.09	0.00107

Ambient Seawater	6C	0.18		0.35707502	100	0	0.18	0.002141
Ambient Seawater	6D	0.03	2.1	0.36214367	61.10081	38.89919	0.835213	0.010001
Ambient Seawater	6D	0.54	2.85	0	62.27074	37.72926	1.411546	0.017001
Ambient Seawater	6D	0.45	2.79	0	61.30694	38.69306	1.355418	0.016316
Ambient Seawater	6D	0.75	3.09	0	62.37512	37.62488	1.630422	0.019681
Ambient Seawater	6D	0.96	3.66	0.38364454	61.111	38.889	2.010003	0.024357
Ambient Seawater	6D	1.44	3.9	0	63.71882	36.28118	2.332517	0.028358

Table A.4.: Tubeworm calcite data. Values of wt%$MgCO_3$ in each of up to two calcites identified, the % of each type of calcite in the sample tested (determined by the peak ratio), the overall Mg content of the sample, and the skeletal Mg/Ca value calculated from the equation Mg:Ca = (10,010 9 wt% MgCO3)/ (843,000–8,430 9 wt% Mg CO3).

Treatment	Tank	Wt% Mg in LMC	Wt% Mg in HMC	Peak Ratio	% LMC	% HMC	Mg content	Skeletal Mg/Ca
1.5	1	2.61	9.54	0.663313	26.90025	73.09975	7.675813	0.098722
1.5	1	2.46	11.52	0.691748	23.72271	76.27729	9.370723	0.122775
1.5	1	2.49	9.99	0.66056	27.20788	72.79212	7.949409	0.102545
1.5	2		8.67	1	0	100	8.67	0.112723
1.5	2		8.85	1	0	100	8.85	0.11529
1.5	2	0	7.71	0.680478	24.98214	75.01786	5.783877	0.072895
1.5	3	3.39	10.56	0.781884	13.64996	86.35004	9.581298	0.125827
1.5	3	4.47	10.11	0.755922	16.55116	83.44884	9.176514	0.119974
1.5	3	3.168	10.59	0.796358	12.03254	87.96746	9.696945	0.127508
1.5	4	2.58	8.91	0.443046	51.51507	48.48493	5.649096	0.071095
1.5	4	2.34	9.15	0.43016	52.95514	47.04486	5.543755	0.069692
1.5	4	3.06	11.43	0.312983	66.04965	33.95035	5.901644	0.074473
2.5	1		9.36	1	0	100	9.36	0.12262
2.5	1	8.55	11.49	0.477748	47.63722	52.36278	10.08947	0.133249
2.5	1		11.25	1	0	100	11.25	0.150519
2.5	2	5.91	8.85	0.591923	34.87805	65.12195	7.824585	0.100798
2.5	2		9.84	1	0	100	9.84	0.129595
2.5	2		7.89	1	0	100	7.89	0.101713
2.5	3		9.63	1	0	100	9.63	0.126534
2.5	3		9.9	1	0	100	9.9	0.130472
2.5	3		9.81	1	0	100	9.81	0.129157
2.5	4		9.69	1	0	100	9.69	0.127407
2.5	4		10.11	1	0	100	10.11	0.133551
2.5	4		8.7	1	0	100	8.7	0.11315
3.5	1		10.62	1	0	100	10.62	0.141088
3.5	1		10.8	1	0	100	10.8	0.143769
3.5	1		9.9	1	0	100	9.9	0.130472
3.5	2		7.56	1	0	100	7.56	0.097111
3.5	2		8.55	1	0	100	8.55	0.111017
3.5	2		8.01	1	0	100	8.01	0.103395
3.5	3		10.59	1	0	100	10.59	0.140642
3.5	3		11.13	1	0	100	11.13	0.148712
3.5	3		9.48	1	0	100	9.48	0.124357
3.5	4		8.76	1	0	100	8.76	0.114005
3.5	4		8.25	1	0	100	8.25	0.106771
3.5	4		8.07	1	0	100	8.07	0.104237
4.5	1	9.42	11.73	0.456653	49.9945	50.0055	10.57513	0.140422
4.5	1		8.97	1	0	100	8.97	0.117008
4.5	1		9.66	1	0	100	9.66	0.126971
4.5	2		12.03	1	0	100	12.03	0.162382
4.5	2		11.76	1	0	100	11.76	0.158252

4.5	2		8.31	1	0	100	8.31	0.107618
4.5	3		8.58	1	0	100	8.58	0.111443
4.5	3		9.42	1	0	100	9.42	0.123488
4.5	3		9.9	1	0	100	9.9	0.130472
4.5	4	9.99	12.69	0.452687	50.43774	49.56226	11.32818	0.151698
4.5	4		10.38	1	0	100	10.38	0.13753
4.5	4		9.72	1	0	100	9.72	0.127844
5.3	1		8.88	1	0	100	8.88	0.115719
5.3	1		9.09	1	0	100	9.09	0.11873
5.3	1		9.93	1	0	100	9.93	0.130911
5.3	2		8.07	1	0	100	8.07	0.104237
5.3	2		11.07	1	0	100	11.07	0.147811
5.3	2		9	1	0	100	9	0.117438
5.3	3		9.09	1	0	100	9.09	0.11873
5.3	3		9.21	1	0	100	9.21	0.120456
5.3	3	8.91	10.53	0.49715	45.46898	54.53102	9.793403	0.128915
5.3	4		9.12	1	0	100	9.12	0.119161
5.3	4	9.54	10.95	0.483596	46.98364	53.01636	10.28753	0.136165
5.3	4		9.78	1	0	100	9.78	0.128719
Ambient Seawater	1		10.77	1	0	100	10.77	0.143321
Ambient Seawater	1		11.04	1	0	100	11.04	0.14736
Ambient Seawater	1		11.16	1	0	100	11.16	0.149163
Ambient Seawater	2		10.02	1	0	100	10.02	0.132229
Ambient Seawater	2		9.3	1	0	100	9.3	0.121754
Ambient Seawater	2		10.62	1	0	100	10.62	0.141088
Ambient Seawater	3		10.86	1	0	100	10.86	0.144665
Ambient Seawater	3		10.26	1	0	100	10.26	0.135759
Ambient Seawater	3		9.54	1	0	100	9.54	0.125227
Ambient Seawater	4		10.26	1	0	100	10.26	0.135759
Ambient Seawater	4		9.63	1	0	100	9.63	0.126534
Ambient Seawater	4		9.27	1	0	100	9.27	0.121321

Table A.4.: Oyster calcite data. Values of wt%$MgCO_3$ in each of up to two calcites identified, the % of each type of calcite in the sample tested (determined by the peak ratio), the overall Mg content of the sample, and the skeletal Mg/Ca value calculated from the equation Mg:Ca = (10,010 9 wt% MgCO3)/ (843,000–8,430 9 wt% MgCO3).

Treatment	Individual	Wt% Mg in C	Wt% Mg in LMC	Peak Ratio	% C	% LMC	Mg content	Skeletal Mg/Ca
1.5	O1A1	1.83		0	100	0	1.83	0.022135
1.5	O1A2	0.18		0	100	0	0.18	0.002141
1.5	O1A3	0.21	3.33	0.429653	53.01174	46.98826	1.676034	0.020241
1.5	O1A4	1.62		0	100	0	1.62	0.019553
1.5	O1B1	0.09	2.97	0.339397	63.09793	36.90207	1.15278	0.013848
1.5	O1B2	2.22	4.62	0.368076	59.893	40.107	3.182568	0.039033
1.5	O1B3	0.66	2.73	0.46124	49.4819	50.5181	1.705725	0.020606
1.5	O1B4	4.26		0	100	0	4.26	0.052835
1.5	O1C1	0.48	2.73	0.410901	55.10734	44.89266	1.490085	0.017961
1.5	O1C2	0.39	3.12	0.38076	58.47558	41.52442	1.523617	0.018372
1.5	O1C3	0.21	2.82	0.371521	59.50807	40.49193	1.266839	0.015236
1.5	O1C4	0.57	3	0.377123	58.88203	41.11797	1.569167	0.01893
1.5	O1D1	1.65		0	100	0	1.65	0.019921
1.5	O1D2	0.6	3	0.333296	63.77966	36.22034	1.469288	0.017707
1.5	O1D3	0.93	3.54	0.355566	61.29105	38.70895	1.940304	0.023496
1.5	O1D4	0.66	3.12	0.35039	61.86946	38.13054	1.598011	0.019283
2.5	O2A1	0	2.31	0.347694	62.17072	37.82928	0.873856	0.010468
2.5	O2A2	0.42	3.3	0.322064	65.03487	34.96513	1.426996	0.01719
2.5	O2A3	0		0	100	0	0	0
2.5	O2A4	0.72	3.09	0.371776	59.47953	40.52047	1.680335	0.020294
2.5	O2B1	0.39	3	0.331575	63.97196	36.02804	1.330332	0.01601
2.5	O2B2	0.54	3.18	0.363384	60.41736	39.58264	1.584982	0.019124
2.5	O2B3	0.93		0	100	0	0.93	0.011147
2.5	O2B4	0.12	2.55	0.362389	60.52855	39.47145	1.079156	0.012954
2.5	O2C1	0.54	3	0.342363	62.76644	37.23356	1.455946	0.017544
2.5	O2C2	0.45	2.79	0.366612	60.05656	39.94344	1.384677	0.016673
2.5	O2C3	0.57		0	100	0	0.57	0.006807
2.5	O2C4	0.48	2.73	0.360287	60.76347	39.23653	1.362822	0.016406
2.5	O2D1	0.87		0	100	0	0.87	0.010421
2.5	O2D2	0.39	1.68	0.523336	42.54268	57.45732	1.131199	0.013586
2.5	O2D3	0.42	2.91	0.348672	62.06143	37.93857	1.36467	0.016429
2.5	O2D4	0.15		0	100	0	0.15	0.001784
3.5	O3A1	0.06	2.67	0.351876	61.70335	38.29665	1.059543	0.012716
3.5	O3A2	0.63	3.06	0.339366	63.1014	36.8986	1.526636	0.018409
3.5	O3A3	0.87	3.39	0.372596	59.38788	40.61212	1.893425	0.022917
3.5	O3A4	0.03	2.82	0.34566	62.398	37.602	1.079096	0.012953
3.5	O3B1	0.33	3.12	0.34104	62.91423	37.08577	1.364693	0.016429
3.5	O3B2	1.02		0	100	0	1.02	0.012237
3.5	O3B3	0.21	2.4	0.358573	60.955	39.045	1.065085	0.012783
3.5	O3B4	1.23		0	100	0	1.23	0.014787
3.5	O3C1	1.32	3.75	0.340298	62.99724	37.00276	2.219167	0.026949

3.5	O3C2	0.39		0	100	0	0.39	0.004649
3.5	O3C3	0.78	3.18	0.345852	62.37659	37.62341	1.682962	0.020326
3.5	O3C4	0.51	2.76	0.383318	58.18969	41.81031	1.450732	0.01748
3.5	O3D1	0	2.61	0.338261	63.22483	36.77517	0.959832	0.011508
3.5	O3D2	0.51		0	100	0	0.51	0.006087
3.5	O3D3	0.03	2.79	0.345706	62.39286	37.60714	1.067957	0.012818
3.5	O3D4	0.54	3.06	0.359623	60.83762	39.16238	1.526892	0.018412
4.5	O4A1	0.63	2.25	0.513298	43.66446	56.33554	1.542636	0.018605
4.5	O4A2	0.45	2.58	0.373258	59.31391	40.68609	1.316614	0.015842
4.5	O4A3	0.42	3	0.344358	62.54344	37.45656	1.386379	0.016694
4.5	O4A4	0.27		0	100	0	0.27	0.003215
4.5	O4B1	0.51	3.15	0.336608	63.40953	36.59047	1.475988	0.017789
4.5	O4B2	0.33	2.76	0.355774	61.26779	38.73221	1.271193	0.015289
4.5	O4B3	1.11	3.57	0.366593	60.05871	39.94129	2.092556	0.025379
4.5	O4B4	0.33		0	100	0	0.33	0.003931
4.5	O4C1	0.87		0	100	0	0.87	0.010421
4.5	O4C2	2.07		0	100	0	2.07	0.025099
4.5	O4C3	0.51	2.76	0.390809	57.35259	42.64741	1.469567	0.01771
4.5	O4C4	0.18		0	100	0	0.18	0.002141
4.5	O4D1	0.06	2.82	0.349562	61.96199	38.03801	1.109849	0.013327
4.5	O4D2	0.84		0	100	0	0.84	0.010059
4.5	O4D3			#DIV/0!	100		0	0
4.5	O4D4	0.06	2.7	0.341039	62.91444	37.08556	1.039059	0.012468
5.3	O5A1	0.15	2.55	0.376245	58.98007	41.01993	1.134478	0.013626
5.3	O5A2	0.06	2.4	0.352724	61.60862	38.39138	0.958358	0.01149
5.3	O5A3	0		0	100	0	0	0
5.3	O5A4	1.14		0	100	0	1.14	0.013693
5.3	O5B1	0.33		0	100	0	0.33	0.003931
5.3	O5B2	0.42	2.97	0.353436	61.52908	38.47092	1.401009	0.016872
5.3	O5B3	0.66	3.18	0.36248	60.51841	39.48159	1.654936	0.019982
5.3	O5B4	0.06	2.64	0.379668	58.59757	41.40243	1.128183	0.013549
5.3	O5C1	0.66	3	0.367993	59.90233	40.09767	1.598285	0.019287
5.3	O5C2	0.3	2.82	0.328376	64.32945	35.67055	1.198898	0.014409
5.3	O5C3	0.3	2.7	0.368619	59.83237	40.16763	1.264023	0.015201
5.3	O5C4	0.27	2.67	0.370896	59.57792	40.42208	1.24013	0.014911
5.3	O5D1	0.21	2.79	0.345121	62.45827	37.54173	1.178577	0.014162
5.3	O5D2	0.42	3.03	0.367023	60.01064	39.98936	1.463722	0.017639
5.3	O5D3	0.63	2.76	0.361677	60.60813	39.39187	1.469047	0.017704
5.3	O5D4	0.36	2.67	0.361749	60.60007	39.39993	1.270138	0.015276
Ambient Seawater	O6A1	0.12		0	100	0	0.12	0.001427
Ambient Seawater	O6A2	0.75		0	100	0	0.75	0.008973
Ambient Seawater	O6A3	0	0.84	0.477311	47.68596	52.31404	0.439438	0.005241
Ambient Seawater	O6A4	0.66		0	100	0	0.66	0.007889
Ambient Seawater	O6B1	0	2.88	0.319473	65.32441	34.67559	0.998657	0.011978
Ambient Seawater	O6B2	0.99	2.4	0.529497	41.85416	58.14584	1.809856	0.021887
Ambient Seawater	O6B3	1.26	4.32	0.323662	64.85625	35.14375	2.335399	0.028394
Ambient Seawater	O6B4	1.11		0	100	0	1.11	0.013328
Ambient Seawater	O6C1	0.42	2.64	0.483369	47.00903	52.99097	1.5964	0.019264

Ambient Seawater	O6C2	0.45	2.79	0.351338	61.7635	38.2365	1.344734	0.016185
Ambient Seawater	O6C3	0		0	100	0	0	0
Ambient Seawater	O6C4	0.63	2.88	0.335349	63.55021	36.44979	1.45012	0.017472
Ambient Seawater	O6D1	1.65		0.114452	88.23549	11.76451	1.455886	0.017543
Ambient Seawater	O6D2	0.39	2.73	0.35175	61.71746	38.28254	1.285811	0.015467
Ambient Seawater	O6D3	0.33	2.91	0.345404	62.42661	37.57339	1.299393	0.015632
Ambient Seawater	O6D4	0.42	2.91	0.360744	60.71237	39.28763	1.398262	0.016839