Table S1: Summary results from mixed effects model for net community calcification models from net (24 hours), daytime, and nighttime samples. Bold p-values are significant at the $\alpha < 0.05$ level.

	Substrate	SS	MS	NumDF	DenDF	F	P
Net							
	Coral	431.96	215.98	2	52	29.73	**<0.001**
	Algae	66.90	33.45	2	54	22.86	**<0.001**
	Rubble	6.26	3.13	2	54	4.69	**0.01**
	Sand	54.15	27.08	2	54	6.20	**<0.001**
	Mixed	262.29	131.15	2	241	75.08	**<0.001**
Day							
	Coral	302.58	151.29	2	28	16.90	**<0.001**
	Algae	54.47	27.24	2	30	29.97	**<0.001**
	Rubble	5.42	2.71	2	30	4.07	**0.03**
	Sand	37.11	18.56	2	28	3.28	**0.05**
	Mixed	129.55	64.78	2	136	34.06	**<0.001**
Night							
	Coral	136.84	68.42	2	20	13.57	**<0.001**
	Algae	21.73	10.86	2	22	5.63	**>0.001**
	Rubble	1.63	0.81	2	22	1.18	0.33
	Sand	27.76	13.88	2	20	6.35	**0.01**
	Mixed	134.50	67.25	2	103	44.89	**<0.001**

Table S2: Summary results from mixed effects model for net community production models from net (24 hours), daytime (gross community production = NCP - R), and nighttime (respiration) samples. Bold p-values are significant at the $\alpha < 0.05$ level.

	Substrate	SS	MS	NumDF	DenDF	F	P
Net							
	Coral	31.53	15.76	2	54	0.12	0.88
	Algae	10.39	5.20	2	52	0.05	0.95
	Rubble	25.93	12.97	2	52	1.14	0.33
	Sand	80.39	40.20	2	52	0.76	0.47
	Mixed	87.99	43.99	2	241	0.96	0.38
GCP							
	Coral	1228.12	614.06	2	28	3.26	**0.05**
	Algae	830.86	415.43	2	28	2.86	0.07
	Rubble	32.36	16.18	2	28	0.91	0.41
	Sand	2141.40	1070.70	2	28	18.48	**<0.001**
	Mixed	1638.88	819.44	2	136	12.76	**<0.001**
R							
	Coral	317.95	158.97	2	20	10.00	**<0.001**
	Algae	141.58	70.79	2	20	9.04	**<0.001**
	Rubble	30.37	15.18	2	22	6.76	**<0.01**
	Sand	389.63	194.81	2	20	34.47	**<0.001**
	Mixed	17.30	8.65	2	103	0.59	0.55

Table S3: (a) ANOVA table and (b) summary results for pH as a function of NCP by substrate by nutrient level. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA Table

	Mean Sq	NumDF	DenDF	F.value	P
NCP	2.19E+00	1	473.13	1702.06	**<0.001**
Nutrient Level	1.09E-02	2	472.01	4.21	**0.02**
Substrate	2.18E-01	4	472.04	42.35	**<0.001**
NCP:Nutrient Level	1.80E-02	2	472.12	6.98	**<0.001**
NCP:Substrate	3.02E-01	4	472.19	58.63	**<0.001**
Nutrient Level:Substrate	7.27E-03	8	472.01	0.71	0.69
NCP:Nutrient Level:Substrate	7.59E-03	8	472.11	0.74	0.66

(b) Summary Table

	Estimate	SE	DF	t.value	P
(Intercept)	7.93E+00	9.63E-03	44.73	823.35	**<0.001**
NCP	5.90E-03	3.90E-04	472.59	15.12	**<0.001**
Nutrient LevelMed	-1.14E-02	1.23E-02	472.01	-0.93	0.35
Nutrient LevelHigh	-1.29E-02	1.22E-02	472.04	-1.05	0.29
SubstrateCoral	-4.21E-02	1.19E-02	472.05	-3.54	**<0.001**
SubstrateMixed	-3.53E-02	9.68E-03	472.07	-3.65	**<0.001**
SubstrateRubble	1.24E-02	1.17E-02	472.07	1.06	0.29
SubstrateSand	1.16E-02	1.18E-02	472.05	0.98	0.33
NCP:Nutrient LevelMed	7.69E-04	5.08E-04	472.07	1.52	0.13
NCP:Nutrient LevelHigh	8.99E-04	5.01E-04	472.24	1.79	0.07
NCP:SubstrateCoral	-1.41E-03	5.08E-04	472.20	-2.78	**0.01**
NCP:SubstrateMixed	7.92E-04	4.71E-04	472.16	1.68	0.09
NCP:SubstrateRubble	5.12E-03	1.28E-03	472.11	3.99	**<0.001**
NCP:SubstrateSand	-2.06E-03	1.41E-03	472.24	-1.46	0.14
Nutrient LevelMed:SubstrateCoral	1.24E-02	1.67E-02	472.00	0.74	0.46
Nutrient LevelHigh:SubstrateCoral	1.10E-02	1.66E-02	472.02	0.66	0.51
Nutrient LevelMed:SubstrateMixed	1.01E-02	1.36E-02	472.01	0.75	0.46
Nutrient LevelHigh:SubstrateMixed	-9.96E-03	1.35E-02	472.04	-0.74	0.46
Nutrient LevelMed:SubstrateRubble	8.10E-03	1.66E-02	472.01	0.49	0.63
Nutrient LevelHigh:SubstrateRubble	-3.68E-03	1.66E-02	472.01	-0.22	0.82
Nutrient LevelMed:SubstrateSand	2.05E-03	1.66E-02	472.01	0.12	0.90
Nutrient LevelHigh:SubstrateSand	-9.42E-04	1.66E-02	472.02	-0.06	0.95
NCP:Nutrient LevelMed:SubstrateCoral	5.31E-05	6.95E-04	472.00	0.08	0.94
NCP:Nutrient LevelHigh:SubstrateCoral	-4.02E-04	6.44E-04	472.14	-0.62	0.53
NCP:Nutrient LevelMed:SubstrateMixed	6.08E-04	6.14E-04	472.04	0.99	0.32
NCP:Nutrient LevelHigh:SubstrateMixed	2.92E-04	5.97E-04	472.18	0.49	0.62
NCP:Nutrient LevelMed:SubstrateRubble	1.87E-03	1.81E-03	472.04	1.03	0.30
NCP:Nutrient LevelHigh:SubstrateRubble	1.66E-03	1.59E-03	472.31	1.04	0.30
NCP:Nutrient LevelMed:SubstrateSand	2.42E-03	1.65E-03	472.23	1.46	0.14
NCP:Nutrient LevelHigh:SubstrateSand	1.07E-03	1.52E-03	472.14	0.70	0.48

Table S4: Algae: (a) ANOVA table and (b) summary results for NCC as a function of nutrient level by aragonite saturation state. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA						
	Sum Sq	Mean Sq	NumDF	DenDF	F.value	P
Aragonite Staturation	0.46	0.46	1	57	0.19	0.660
Nutrient Level	6.71	3.36	2	57	1.37	0.260
Aragonite Staturation:Nutrient Level	14.15	7.07	2	57	2.89	0.060
(b) Summary						
	Estimate	SE	DF	t.value	P	
(Intercept)	0.87	1.43	57	0.61	0.546	
Aragonite Staturation	0.07	0.45	57	0.15	0.880	
Nutrient LevelMed	-2.80	1.83	57	-1.53	0.132	
Nutrient LevelHigh	-0.81	1.79	57	-0.46	0.651	
Aragonite Staturation:Nutrient LevelMed	0.61	0.57	57	1.08	0.287	
Aragonite Staturation:Nutrient LevelHigh	-0.53	0.56	57	-0.96	0.341	

Table S5: Coral: (a) ANOVA table and (b) summary results for NCC as a function of nutrient level by aragonite saturation state. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA						
	Sum Sq	Mean Sq	NumDF	DenDF	F.value	P
Aragonite Staturation	606.07	606.07	1	51.16	86.85	**<0.001**
Nutrient Level	6.74	3.37	2	46.73	0.48	0.686
Aragonite Staturation:Nutrient Level	69.76	34.88	2	51.40	5.00	**0.010**
(b) Summary						
	Estimate	SE	DF	t.value	P	
(Intercept)	-4.56	2.96	40.96	-1.54	0.131	
Aragonite Staturation	6.38	0.99	51.04	6.42	**<0.0001**	
Nutrient LevelMed	0.08	3.85	50.67	0.02	0.984	
Nutrient LevelHigh	2.81	3.48	46.71	0.81	0.422	
Aragonite Staturation:Nutrient LevelMed	-1.45	1.36	51.04	-1.07	0.291	
Aragonite Staturation:Nutrient LevelHigh	-3.61	1.20	51.04	-3.01	**0.004**	

Table S6: Rubble: (a) ANOVA table and (b) summary results for NCC as a function of nutrient level by aragonite saturation state. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA						
	Sum Sq	Mean Sq	NumDF	DenDF	F.value	P
Aragonite Staturation	58.75	58.75	1	51.82	76.95	**<0.001**
Nutrient Level	1.19	0.97	2	56.70	1.27	0.290
Aragonite Staturation:Nutrient Level	2.94	1.47	2	51.98	1.94	0.160
(b) Summary						
	Estimate	SE	DF	t.value	P	
(Intercept)	-7.57	1.35	56.25	-5.61	**<0.001**	
Aragonite Staturation	2.66	0.47	51.03	5.67	**<0.001**	
Nutrient LevelMed	2.07	1.77	56.75	1.17	0.247	
Nutrient LevelHigh	2.52	1.59	57.00	1.58	0.119	
Aragonite Staturation:Nutrient LevelMed	-0.96	0.61	51.41	-1.56	0.125	
Aragonite Staturation:Nutrient LevelHigh	-1.06	0.55	51.77	-1.92	0.061	

Table S7: Sand: (a) ANOVA table and (b) summary results for NCC as a function of nutrient level by aragonite saturation state. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA						
	Sum Sq	Mean Sq	NumDF	DenDF	F.value	P
Aragonite Staturation	104.65	104.65	1	57	17	**<0.001**
Nutrient Level	29.48	14.74	2	57	2.39	0.100
Aragonite Staturation:Nutrient Level	41.89	20.94	2	57	3.4	**0.040**
(b) Summary						
	Estimate	SE	DF	t.value	P	
(Intercept)	-22.99	8.34	57	-2.76	**0.008**	
Aragonite Staturation	8.32	2.97	57	2.80	**0.007**	
Nutrient LevelMed	10.85	9.16	57	1.18	0.241	
Nutrient LevelHigh	17.15	8.79	57	1.95	**0.056**	
Aragonite Staturation:Nutrient LevelMed	-3.99	3.27	57	-1.22	0.227	
Aragonite Staturation:Nutrient LevelHigh	-6.92	3.13	57	-2.21	**0.031**	

Table S8: Mixed: (a) ANOVA table and (b) summary results for NCC as a function of nutrient level by aragonite saturation state. Bold p-values are significant at the $\alpha < 0.05$ level.

(a) ANOVA						
	Sum Sq	Mean Sq	NumDF	DenDF	F.value	P
Aragonite Staturation	404.01	404.01	1	214.76	241.79	**<0.0001**
Nutrient Level	33.30	16.65	2	243.56	9.97	**<0.0001**
Aragonite Staturation:Nutrient Level	79.90	39.95	2	216.05	23.91	**<0.0001**

(b) Summary					
	Estimate	SE	DF	t.value	P
(Intercept)	-5.13	0.72	183.10	-7.16	**<0.0001**
Aragonite Staturation	2.68	0.25	214.46	10.95	**<0.0001**
Nutrient LevelMed	0.48	0.88	243.35	0.55	0.582
Nutrient LevelHigh	3.03	0.84	243.90	3.63	**<0.0001**
Aragonite Staturation:Nutrient LevelMed	-1.03	0.30	215.20	-3.48	**<0.0001**
Aragonite Staturation:Nutrient LevelHigh	-1.89	0.28	215.50	-6.67	**<0.0001**