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Quantifying functional consequences of habitat degradation on a Caribbean coral reef

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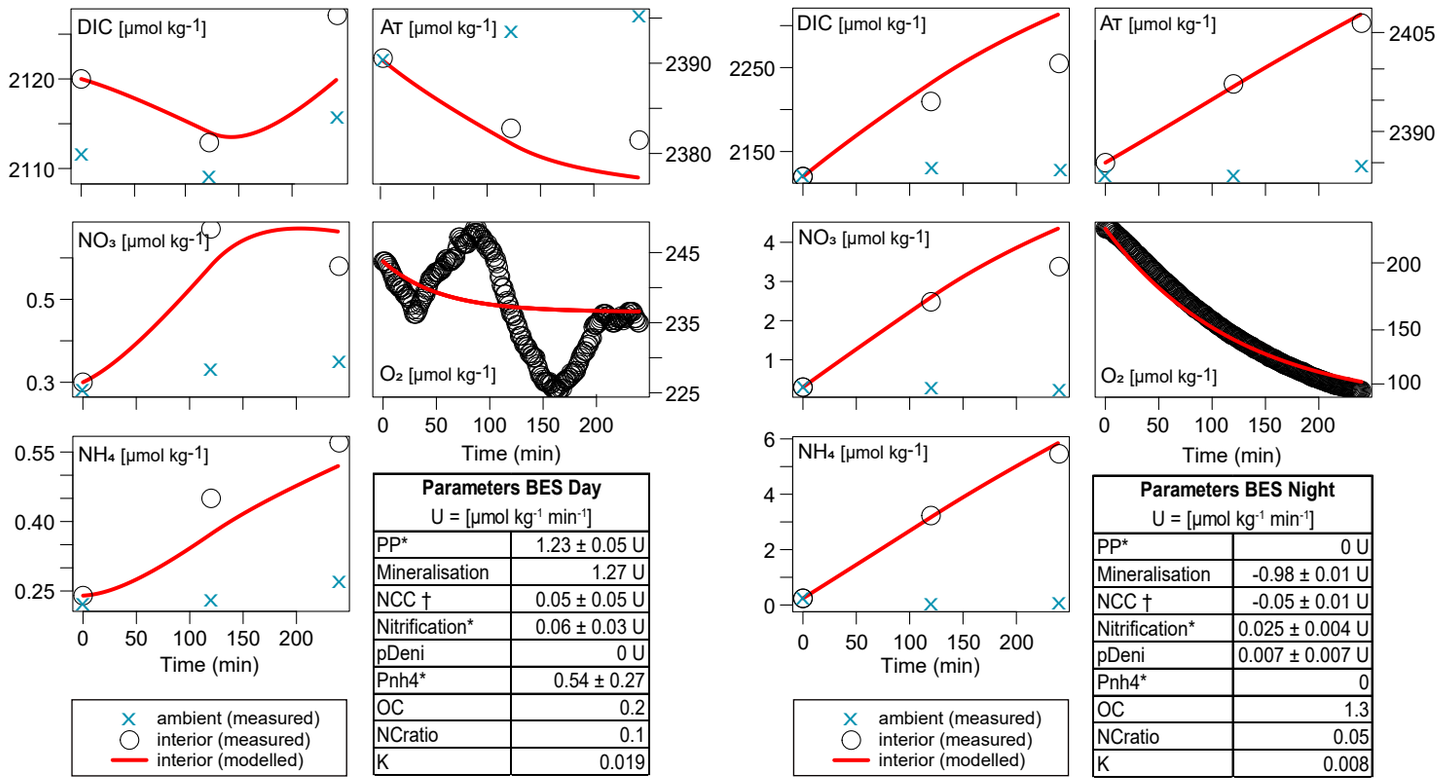

Parameters BES Day U = [µmol kg⁻¹ min⁻¹]	
PP*	1.23 ± 0.05 U
Mineralisation	1.27 U
NCC †	0.05 ± 0.05 U
Nitrification*	0.06 ± 0.03 U
pDeni	0 U
Pnh4*	0.54 ± 0.27
OC	0.2
NCratio	0.1
K	0.019

Parameters BES Night U = [µmol kg⁻¹ min⁻¹]	
PP*	0 U
Mineralisation	-0.98 ± 0.01 U
NCC †	-0.05 ± 0.01 U
Nitrification*	0.025 ± 0.004 U
pDeni	0.007 ± 0.007 U
Pnh4*	0
OC	1.3
NCratio	0.05
K	0.008

Figure S1: Illustrative results of the model (red line) employed to infer the process rates from measured data. The left panel depicts the model output of an incubation performed during the day over a substrate dominated by bioeroding sponges (BES, Fig. 2, replicate 1) while the right panel shows the output for a night-time incubation over a cyanobacterial mat (BCM, Fig. 2, replicate 2). Circles and crosses represent measured values of the state variables inside and outside the tent respectively. Fixed and fitted parameters used to run models are presented in bottom right boxes. Parameters escorted by the star sign * relate to significant parameter estimation (with standard error). The † symbol refers to non-significant parameter estimation. The remaining parameters are fixed. Note that the fixed mineralisation parameter in the left panel was estimated from the data of the same incubation at night (we assume similar mineralisation during the day).

Table S1 depicts the species composition of incubated substrates and mean estimated species-specific rates from the *ReefBudget* methodological approach (https://geography.exeter.ac.uk/reefbudget/caribbean/)

Tent	Taxonomic Group	Species	Cover (%)	Mean Production (g $CaCO_3$ yr^{-1} $colony^{-1}$)*	Mean Bioerosion (kg $CaCO_3$ m^{-2} yr^{-1})*
Coral dominated tent 1	Coral	*Pseudodiploria strigosa*	12.76	0.588	-
		Colpophyllia natans	1.99	0.501	-
		Diploria labyrinthiformis	10.49	0.586	-
		Siderastrea siderea	2.32	0.558	-
		Agaricia humilis	0.21	0.604	-
		Dichocoenia stokesii	6.24	0.239	-
		Millepora alcicornis (Hydrozoa)	1.38	0.107	-
	Algae	*Halimeda* spp.	13.01	N/A	-
		Epilithic Algal Matrix	44.44	-	-
		Crustose Coralline Algae	1.97	0.024	-
	Sponge	*Cliona delitrix*	2.12	-	10.4755
	Other	Sand	3.06	-	-
Coral dominated tent 2	Coral	*Meandrina meandrites*	9.25	0.229	-
		Diploria labyrinthiformis	21.12	0.586	-
		Siderastrea siderea	3.85	0.558	-
	Algae	*Dictyota* spp.	9.55	-	-
		Epilithic Algal Matrix	46.59	-	-
	Sponge	*Desmapsamma anchorata*	0.70	-	-
		Cliona delitrix	0.88	-	10.4755
		Scopalina ruetzleri	0.36	-	-
	Other	*Condylactis gigantea* (Anemone)	1.60	-	-
		Sand	6.11	-	-
Coral dominated tent 3	Coral	*Meandrina meandrites*	5.77	0.229	-
		Pseudodiploria strigosa	23.08	0.588	-
		Siderastrea siderea	4.12	0.558	-
		Millepora complanata (Hydrozoa)	3.02	0.450	-
	Algae	*Dictyota* spp.	1.79	-	-
		Epilithic Algal Matrix	41.58	-	-
	Sponge	*Cliona caribaea*	2.24	-	4.672
	Other	Sand	18.39	-	-

Bioeroding Sponges Tent 1	Coral	*Orbicella faveolata*	2.26	1.169	-
		Agaricia humilis	2.05	0.604	-
		Porites asteroides	4.43	0.675	-
	Algae	*Dictyota* spp.	7.69	-	-
		Epilithic Algal Matrix	32.73	-	-
		Crustose Coralline Algae	2.62	0.024	-
	Sponge	*Cliona delitrix*	22.06	-	10.4755
		Cliona caribbaea	5.50	-	4.672
		Cliona aprica	11.98	-	3.7595
		Scopalina ruetzleri	1.30	-	-
	Other	Sand	7.39	-	-
Bioeroding Sponges Tent 2	Coral	*Siderastrea siderea*	2.94	0.558	-
		Agaricia humilis	1.28	0.604	-
	Algae	*Dictyota spp.*	7.35	-	-
		Epilithic Algal Matrix	39.93	-	-
		Crustose Coralline Algae	2.56	0.024	-
	Sponge	*Cliona delitrix*	28.19	-	10.4755
		Cliona aprica	9.65	-	3.7595
		Desmapsamma anchorata	0.20	-	-
		Chondrilla caribensis	3.77	-	-
	Other	Sand	4.13	-	-
Bioeroding Sponges Tent 3	Coral	*Agaricia agaricites*	0.94	0.604	-
	Algae	*Dictyota* spp.	5.38	-	-
		Epilithic Algal Matrix	48.56	-	-
		Crustose Coralline Algae	1.70	0.024	-
	Sponge	*Cliona delitrix*	26.36	-	10.4755
		Cliona caribbaea	7.23	-	4.672
		Cliona aprica	4.66	-	3.7595
	Other	Sand	5.16	-	-
Epilithic Algal Matrix Tent 1	Algae	*Dictyota* spp.	9.44	-	-
		lobophora spp.	5.80	-	-
		Epilithic Algal Matrix	67.83	-	-
		Crustose Coralline Algae	1.24	0.024	-
	Other	Sand	15.69	-	-
Epilithic Algal Matrix Tent 2	Algae	*Dictyota* spp.	14.79	-	-
		Epilithic Algal Matrix	60.74	-	-
	Other	Sand	24.47	-	-

Epilithic Algal Matrix Tent 3	Algae	*Dictyota* spp.	12.03	-	-
		lobophora spp.	9.23	-	-
		Epilithic Algal Matrix	50.81	-	-
		Crustose Coralline Algae	2.46	0.024	-
	Sponge	*Scopalina ruetzleri*	0.96	-	-
	Other	Sand	24.51	-	-
Benthic Cyanobacterial Mats Tent 1	Algae	Epilithic Algal Matrix	8.12	-	-
	Other	Benthic cyanobacterial mats	90.55	-	-
		Sand	1.33	-	-
Benthic Cyanobacterial Mats Tent 2	Algae	Epilithic Algal Matrix	3.34	-	-
	Other	Benthic cyanobacterial mats	89.50	-	-
		Sand	7.17	-	-
Benthic Cyanobacterial Mats Tent 3	Algae	Epilithic Algal Matrix	4.52	-	-
	Other	Benthic cyanobacterial mats	82.90	-	-
		Sand	12.57	-	-
Sand Tent 1	Other	Sand	100.00	-	-
Sand Tent 2	Other	Sand	100.00	-	-
Sand Tent 3	Other	Sand	100.00	-	-

*Mean estimated species-specific rates from the ReefBudget methodological approach (https://geography.exeter.ac.uk/reefbudget/caribbean/)

Table S2 shows measured variable concentrations for A_T, DIC, NH_4 and NO_3 in µmol kg^{-1}, in and out of incubations over communities dominated either by coral, turf and macroalgae, bioeroding sponges, benthic cyanobacteria mats and sand. Measurements are shown at all three time points during daytime and at nighttime with differences between T_0 and T_4 in and out of incubations.

Substrate type	ID	Measured variable	Time [min] IN			Time [min] OUT			ΔIN	ΔOUT
			0	120	240	0	120	240		
CORAL	1	A_T	2403.8	2386.4	2380.3	2404.0	2403.9	2403.1	-23.5	-0.9
		DIC	2147.9	2139.2	2124.1	2157.8	2161.3	2139.3	-23.8	-18.5
		NH_4	0.42	0.39	0.41	0.43	0.69	0.20	0.0	-0.2
		NO_3	0.32	0.57	0.77	0.21	0.21	0.25	0.5	0.0
		A_T	2402.9	2403.7	2402.2	2404.4	2402.9	2403.3	-0.7	-1.1
		DIC	2154.4	2196.6	2187.9	2142.7	2142.9	2151.2	33.5	8.5
		NH_4	0.24	0.33	0.39	0.18	0.21	0.26	0.2	0.1
		NO_3	0.30		1.01	0.20	0.39	0.48	0.7	0.3
	2	A_T	2380.5	2360.2	2360.0	2378.6	2375.6	2378.3	-20.5	-0.3
		DIC	2107.9	2098.2	2090.5	2111.9	2110.1	2106.2	-17.4	-5.7
		NH_4	0.26	0.31	0.33	0.31	0.29	0.29	0.1	0.0
		NO_3	0.32	0.67	0.63	0.33	0.32	0.27	0.3	-0.1
		A_T	2398.9	2398.0	2397.7	2398.6	2397.4	2396.6	-1.2	-2.0
		DIC	2148.4	2174.2	2195.6	2141.6	2153.0	2174.6	47.2	33.0
		NH_4	0.23	0.31	0.35	0.31	0.21	0.21	0.1	-0.1
		NO_3	0.27	0.46	0.59	0.23	0.30	0.33	0.3	0.1
	3	A_T	2407.5	2395.0	2387.6	2408.4	2408.5	2402.6	-19.9	-5.8
		DIC	2148.6	2133.3	2142.9	2146.6	2146.7	2132.2	-5.7	-14.4
		NH_4	0.29	0.43	0.39	0.27	0.39	0.31	0.1	0.0
		NO_3	0.49	0.81	0.85	0.46	0.56	0.44	0.4	0.0
TMA	1	A_T	2401.6	2396.9	2394.2	2404.8	2403.3	2402.6	-7.5	-2.3
		DIC	2141.6	2141.5	2136.3	2145.5	2142.4	2142.4	-5.3	-3.1
		NH_4	0.32	0.35	0.36	0.51	0.33	0.33	0.0	-0.2
		NO_3	0.26	0.24	0.20	0.40	0.21	0.26	-0.1	-0.1
		A_T	2402.2	2402.3	2403.6	2401.8	2401.2	2400.1	1.3	-1.6
		DIC	2149.9	2155.9	2147.8	2147.6	2139.6	2146.3	-2.1	-1.3
		NH_4	0.37	0.36	0.00	0.43	0.33	0.00	-0.4	-0.4
		NO_3	0.24	0.32	0.00	0.24	0.30	0.00	-0.2	-0.2
	2	A_T	2395.4	2391.6	2391.1	2394.6	2395.0	2395.0	-4.4	0.5
		DIC	2133.9	2128.3	2134.5	2140.4	2125.4	2133.6	0.6	-6.8
		NH_4	0.26	0.29	0.26	0.26	0.26	0.29	0.0	0.0
		NO_3	0.15	0.17	0.18	0.15	0.29	0.16	0.0	0.0
		A_T	2397.3	2401.9	2401.9	2396.1	2397.7	2398.2	4.7	2.1
		DIC	2135.5	2149.0	2156.3	2137.8	2146.7	2146.6	20.8	8.8
		NH_4	0.23	0.55	0.26	0.23	0.25	0.27	0.0	0.0
		NO_3	0.36	0.33	0.29	0.34	0.38	0.41	-0.1	0.1
	3	A_T	2394.7	2390.3	2388.4	2392.2	2393.7	2392.9	-6.3	0.6
		DIC	2156.3	2131.9	2123.5	2140.1	2143.0	2138.8	-32.8	-1.3
		NH_4	0.76	0.64	0.64	0.84	0.32	0.29	-0.1	-0.6
		NO_3	0.37	0.52	0.24	0.32	0.41	0.36	-0.1	0.0

BES	1	A_T	2389.4	2379.2	2377.7	2388.8	2384.5	2390.0	-11.7	1.3
		DIC	2110.6	2096.2	2120.1	2110.6	2128.2	2108.8	9.5	-1.8
		NH_4	0.21	0.33	0.39	0.21	0.21	0.23	0.2	0.0
		NO_3	0.41	0.55	0.50	0.36	0.33	0.29	0.1	-0.1
		A_T	2402.8	2411.1	2413.9	2402.6	2402.6	2397.4	11.1	-5.2
		DIC	2143.3	2207.7	2213.2	2150.2	2142.3	2142.0	69.9	-8.2
		NH_4	0.37	0.33	0.36	0.40	0.20	0.30	0.0	-0.1
		NO_3	0.35	0.42	0.38	0.23	0.28	0.23	0.0	0.0
	2	A_T	2377.9	2370.1	2369.1	2378.2	2381.0	2382.9	-8.8	4.7
		DIC	2117.3	2110.2	2124.4	2108.9	2106.3	2113.0	7.1	4.1
		NH_4	0.22	0.43	0.55	0.20	0.21	0.25	0.3	0.1
		NO_3	0.28	0.65	0.56	0.26	0.31	0.33	0.3	0.1
		A_T	2377.0	2388.8	2394.1	2377.8	2378.0	2379.3	17.1	1.5
		DIC	2126.3	2185.8	2190.2	2112.3	2122.3	2122.0	63.9	9.7
		NH_4	0.29	0.73	0.47	0.18	0.20	0.21	0.2	0.0
		NO_3	0.31	0.74	0.65	0.19	0.23	0.29	0.3	0.1
	3	A_T	2396.3	2390.0	2379.0	2398.9	2400.3	2401.8	-17.2	2.9
		DIC	2137.4	2129.9	2121.3	2148.5	2147.8	2144.3	-16.1	-4.2
		NH_4	0.23	0.44	0.52	0.19	0.58	0.24	0.3	0.1
		NO_3	0.77	0.77	0.77	0.78	0.62	0.59	0.0	-0.2
BCM	1	A_T	2392.6	2388.4	2377.7	2391.9	2391.4	2390.3	-15.0	-1.5
		DIC	2121.3	2109.5	2052.7	2128.1	2130.0	2124.7	-68.6	-3.4
		NH_4	0.30	0.55	0.29	0.21	0.46	0.27	0.0	0.1
		NO_3	0.38	1.07	1.32	0.34	0.52	0.38	0.9	0.0
		A_T	2367.3	2373.0	2376.5	2365.3	2362.0	2364.5	9.2	-0.9
		DIC	2095.8	2144.8	2186.2	2104.0	2093.4	2095.1	90.4	-8.9
		NH_4	0.24	0.79	0.89	0.53	0.31	0.69	0.7	0.2
		NO_3	0.33	1.31	1.58	0.37	0.43	0.36	1.3	0.0
	2	A_T	2389.7	2379.5	2379.0	2390.3	2389.0	2387.9	-10.8	-2.5
		DIC	2118.0	2067.7	2105.4	2124.7	2112.2	2108.0	-12.6	-16.7
		NH_4	0.25	0.37	0.34	0.27	0.26	0.25	0.1	0.0
		NO_3	0.53	1.53	1.61	0.38	0.35	0.31	1.1	-0.1
		A_T	2369.1	2382.4	2393.3	2366.9	2366.6	2368.4	24.3	1.5
		DIC	2088.9	2178.5	2223.8	2089.2	2100.2	2095.9	134.9	6.7
		NH_4	0.5	3.5	5.7	0.5	0.3	0.3	5.2	-0.2
		NO_3	0.3	2.5	3.4	0.3	0.3	0.2	3.1	-0.1
	3	A_T	2366.0	2357.3	2353.8	2365.4	2368.3	2369.7	-12.3	4.3
		DIC	2097.7	2070.4	2032.7	2095.0	2102.1	2099.3	-65.0	4.3
		NH_4	0.44	1.50	1.84	0.44	0.57	0.41	1.4	0.0
		NO_3	0.46	1.99	2.50	0.46	0.30	0.20	2.0	-0.3

SAND	1	A_T	2363.0	2366.0	2366.4	2363.8	2367.9	2366.7	3.4	2.9
		DIC	2111.9	2109.5	2091.2	2104.0	2100.3	2095.4	-20.7	-8.6
		NH_4	0.21	0.22	0.27	0.28	0.17	0.20	0.1	-0.1
		NO_3	0.22	0.18	0.16	0.28	0.26	0.24	-0.1	0.0
		A_T	2375.0	2375.9	2375.3	2374.8	2375.3	2376.5	0.3	1.7
		DIC	2113.0	2125.3	2133.7	2117.2	2117.5	2114.4	20.7	-2.8
		NH_4	0.2	0.4	0.3	0.2	0.2	0.2	0.1	0.1
		NO_3	0.2	0.2	0.2	0.3	0.3	0.4	0.1	0.1
	2	A_T	2369.6	2369.3	2368.0	2366.7	2370.2	2365.3	-1.6	-1.5
		DIC	2095.8	2101.0	2100.6	2095.4	2103.1	2098.2	4.8	2.8
		NH_4	0.20	0.29	0.29	0.20	0.32	0.17	0.1	0.0
		NO_3	0.28	0.12	0.10	0.24	0.21	0.17	-0.2	-0.1
		A_T	2378.4	2380.0	2382.4	2377.4	2378.6	2378.6	3.9	1.2
		DIC	2114.6	2123.5	2145.8	2118.0	2109.5	2122.3	31.2	4.3
		NH_4	0.70	1.00	0.83	0.59	0.72	0.72	0.1	0.1
		NO_3	0.31	0.19	0.11	0.94	0.28	0.23	-0.2	-0.7
	3	A_T	2375.6	2375.7	2376.3	2375.6	2375.6	2377.4	0.7	1.8
		DIC	2123.1	2109.3	2107.3	2115.1	2115.1	2114.7	-15.8	-0.4
		NH_4	0.42	0.23	0.37	0.37	0.25	0.35	-0.1	0.0
		NO_3	0.27	0.17	0.13	0.26	0.20	0.17	-0.1	-0.1

Table S3 presents the model output for all incubations carried out on substrates dominated by coral, turf and macroalgae (TMA), bioeroding sponges (BES), benthic cyanobacterial mats and sand during the day and night. Values escorted by the star sign * relate to fixed parameters. The † symbol refers to fixed parameters estimated from the data of the same incubation at night (we assume similar mineralisation during the day).

Type of Substrate	Light Regime	Replicate	Parameters	Estimated value (µmol $kg^{-1}min^{-1}$)	Standard Error	*p* -value
BES	Night	1	Primary Production	0*		
			Mineralisation	1.27	0.004	**<0.001**
			Net Community Calcification	-0.03	0.01	**0.002**
			Nitrification	0.06	0.0002	**<0.001**
			pDeni	0.06	0.0002	**<0.001**
			Pnh4	x		
			OC	1.3*		
			NCratio	0.05*		
			Leak	0.02*		
		2	Primary Production	0*		
			Mineralisation	0.89	0.008	**<0.001**
			Net Community Calcification	-0.044	0.03	0.13
			Nitrification	0.01	0.002	**<0.001**
			pDeni	0.012	0.004	**0.007**
			Pnh4	x		
			OC	2*		
			NCratio	0.017*		
			Leak	0.02*		
BES	Day	1	Primary Production	1.23	0.05	**<0.001**
			Mineralisation	1.27†		
			Net Community Calcification	0.048	0.05	0.088
			Nitrification	0.06	0.03	**0.047**
			pDeni	0*		
			Pnh4	0.54	0.27	**0.049**
			OC	1.2*		
			NCratio	0.1*		
			Leak	0.019*		
		2	Primary Production	1.03	0.001	**<0.001**
			Mineralisation	0.89†		
			Net Community Calcification	0.016	0.01	**0.013**
			Nitrification	0.0003	0.059	0.997
			pDeni	0*		
			Pnh4	0.99	0.004	**<0.001**
			OC	2.5*		
			NCratio	0.02*		
			Leak	0.015*		
		3	Primary Production	0.88	0.001	**<0.001**
			Mineralisation	0.9†		
			Net Community Calcification	0.026	0.044	0.112
			Nitrification	0.002	0.044	0.97
			pDeni	0*		
			Pnh4	0.96	0.03	**<0.001**
			OC	2*		
			NCratio	0.07*		
			Leak	0.018*		

Type of Substrate	Light Regime	Replicate	Parameters	Estimated value (µmol $kg^{-1}min^{-1}$)	Standard Error	*p*-value
CORAL	Night	1	Primary Production	0*		
			Mineralisation	0.88		
			Net Community Calcification	-0.002	0.0005	**<0.001**
			Nitrification	0.02	0.0001	**<0.001**
			pDeni	0.03	0.0004	**<0.001**
			Pnh4	x		
			OC	1.6*		
			NCratio	0.025*		
			Leak	0.018*		
		2	Primary Production	0*		
			Mineralisation	0.99	0.005	**<0.001**
			Net Community Calcification	0.003	0.002	0.127
			Nitrification	0.008	0.0004	**<0.001**
			pDeni	0.008	0.001	**<0.001**
			Pnh4	x		
			OC	1.6*		
			NCratio	0.009*		
			Leak	0.025*		
CORAL	Day	1	Primary Production	0.92	0.003	**<0.001**
			Mineralisation	0.8†		
			Net Community Calcification	0.02	0.05	0.71
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.85	0.02	**<0.001**
			OC	1.2*		
			NCratio	0.02*		
			Leak	0.011*		
		2	Primary Production	1.04	0.009	**<0.001**
			Mineralisation	0.8†		
			Net Community Calcification	0.03	0.14	0.862
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.79	0.12	**<0.001**
			OC	1*		
			NCratio	0.027*		
			Leak	0.03*		
		3	Primary Production	0.87	0.01	**<0.001**
			Mineralisation	0.8†		
			Net Community Calcification	0.04	0.12	0.741
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.93	0.03	**<0.001**
			OC	1*		
			NCratio	0.028*		
			Leak	0.027*		

Type of Substrate	Light Regime	Replicate	Parameters	Estimated value (µmol $kg^{-1}min^{-1}$)	Standard Error	*p*-value
BCM	Night	1	Primary Production	0*		
			Mineralisation	0.65	0.002	**<0.001**
			Net Community Calcification	-0.027	0.005	**<0.001**
			Nitrification	0.008	0.001	**<0.001**
			pDeni	0.0004	0.003	0.906
			Pnh4	x		
			OC	1.7*		
			NCratio	0.02*		
			Leak	0.012*		
		2	Primary Production	0*		
			Mineralisation	0.98	0.008	**<0.001**
			Net Community Calcification	-0.05	0.009	**<0.001**
			Nitrification	0.025	0.004	**<0.001**
			pDeni	0.007	0.007	0.297
			Pnh4	x		
			OC	1.3*		
			NCratio	0.05*		
			Leak	0.008*		
BCM	Day	1	Primary Production	0.21	0.007	**<0.001**
			Mineralisation	0*		
			Net Community Calcification	0.01	0.01	0.243
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0		
			OC	2*		
			NCratio	0.01*		
			Leak	0.008*		
		2	Primary Production	0.47	0.008	**<0.001**
			Mineralisation	0*		
			Net Community Calcification	0.03	0.02	0.222
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.24	0.22	0.28
			OC	1.7*		
			NCratio	0.047*		
			Leak	0.008*		
TMA	Night	1	Primary Production	0*		
			Mineralisation	0.17	0.001	**<0.001**
			Net Community Calcification	-0.015	0.005	**0.002**
			Nitrification	0.001	0.0007	0.413
			pDeni	0.006	0.005	0.254
			Pnh4	x		
			OC	1.4*		
			NCratio	0.05*		
			Leak	0.008*		
		2	Primary Production	0*		
			Mineralisation	0.18	0.001	**<0.001**
			Net Community Calcification	-0.001	0.0005	**0.005**
			Nitrification	0.004	0.0001	**<0.001**
			pDeni	0.023	0.003	**<0.001**
			Pnh4	x		
			OC	3*		
			NCratio	0.02*		
			Leak	0.02*		

TMA	Day	1	Primary Production	0.12	0.005	**<0.001**
			Mineralisation	0*		
			Net Community Calcification	0*		
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.7	0.18	**<0.001**
			OC	2.2*		
			NCratio	0.02*		
			Leak	0.02*		
		3	Primary Production	0.28	0.004	**<0.001**
			Mineralisation	0*		
			Net Community Calcification	0.016	0.029	0.586
			Nitrification	0*		
			pDeni	0*		
			Pnh4	0.86	0.48	0.076
			OC	1.5*		
			NCratio	0.01*		
			Leak	0.03*		
Type of Substrate	**Light Regime**	**Replicate**	**Parameters**	**Estimated value (µmol $kg^{-1}min^{-1}$)**	**Standard Error**	***p*-value**
SAND	Night	1	Primary Production	0*		
			Mineralisation	0.19	0.0015	**<0.001**
			Net Community Calcification	-0.003	0.0009	**0.0002**
			Nitrification	0.0008	0.0004	**0.02**
			pDeni	0.005	0.002	**0.038**
			Pnh4	x		
			OC	1.4*		
			NCratio	0.01*		
			Leak	0.008*		
		2	Primary Production	0*		
			Mineralisation	0.19	0.19	**<0.001**
			Net Community Calcification	-0.003	0.002	**0.05**
			Nitrification	0.001	0.001	0.4252
			pDeni	0.01	0.006	**0.008**
			Pnh4	x		
			OC	1.6*		
			NCratio	0.02*		
			Leak	0.008*		
SAND	Day	1	Primary Production	0.11	0.005	**<0.001**
			Mineralisation	0.1*		
			Net Community Calcification	-0.004	0.009	0.682
			Nitrification	0.002	0.003	0.585
			pDeni	0*		
			Pnh4	0.68	0.49	0.17
			OC	1.2*		
			NCratio	0.06*		
			Leak	0.004*		
		2	Primary Production	0.09	0.005	**<0.001**
			Mineralisation	0.15*		
			Net Community Calcification	0.004	0.007	0.564
			Nitrification	0.003	0.002	0.247
			pDeni	0.03	0.04	0.421
			Pnh4	1*		
			OC	1.2*		
			NCratio	0.05*		
			Leak	0.04*		
		3	Primary Production	0.1*		
			Mineralisation	0.13	0.005	**<0.001**
			Net Community Calcification	-0.001	0.001	0.291
			Nitrification	0.002	0.002	0.397
			pDeni	0.02	0.03	0.3375
			Pnh4	1*		
			OC	1*		
			NCratio	0.02*		
			Leak	0.019*		