**Supplementary Table S1: Transect level estimates of carbonate production by each green algal species and by seagrass epiphytes**

**Fringe mangrove habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 0.0000 | 0.0000 | 0.0000 | 0.0645 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1890 | 3.0084 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.204 |
| *Penicillus capitatus.* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.6486 | 0.8017 | 2.9177 | 0.0000 | 0.0000 | 0.0000 | 0.273 |
| *Penicillus dumetosus* | 1.1496 | 16.8084 | 1.2711 | 9.9517 | 2.2526 | 4.7165 | 14.3163 | 3.5781 | 0.2769 | 1.2704 | 3.5196 | 4.5546 | 3.1453 | 0.0000 | 0.0000 | 0.5755 | 4.212 |
| *Udotea cyathiformis* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Udotea flabellum* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Rhipocephalus spp.* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Acetabularia* | 0.0000 | 6.9064 | 5.3513 | 0.0000 | 0.0000 | 0.0000 | 3.7505 | 0.0000 | 0.0000 | 0.0000 | 0.4116 | 0.1830 | 12.4865 | 0.0000 | 0.0000 | 0.4574 | 1.847 |
| *Seagrass epiphytes* | 1.0903 | 0.0000 | 0.0000 | 0.5947 | 0.8425 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1487 | 0.4956 | 0.198 |
|  | **2.2399** | **23.7149** | **6.6225** | **10.6109** | **3.0951** | **4.7165** | **18.0668** | **3.5781** | **0.2769** | **1.2704** | **4.7689** | **8.5476** | **18.5494** | **0.0000** | **0.1487** | **1.5285** | **6.733** |

**Hardground habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 5.0473 | 8.6943 | 3.5313 | 7.7040 | 3.0249 | 12.5160 | 17.2092 | 5.3851 | 19.4848 | 21.2307 | 0.2100 | 0.0701 | 0.9448 | 0.2934 | 0.3417 | 0.3733 | 6.629 |
| *Penicillus capitatus.* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2433 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.015 |
| *Penicillus dumetosus* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Udotea cyathiformis* | 2.6116 | 1.7940 | 8.1373 | 11.9976 | 0.1168 | 1.0888 | 11.5406 | 3.1544 | 2.3288 | 0.1262 | 0.0000 | 0.0000 | 0.1766 | 0.0000 | 0.0489 | 0.0128 | 2.696 |
| *Udotea flabellum* | 0.4068 | 1.9231 | 4.0737 | 1.0853 | 0.0960 | 2.2091 | 1.8430 | 0.3557 | 0.6503 | 2.1882 | 0.0691 | 0.8499 | 0.0000 | 0.7085 | 0.0862 | 0.6703 | 1.076 |
| *Rhipocephalus spp.* | 0.2952 | 3.3462 | 1.7715 | 3.9367 | 1.2991 | 0.0000 | 3.4643 | 0.9054 | 0.6102 | 1.2597 | 1.9880 | 1.2597 | 0.5511 | 0.3149 | 0.0000 | 3.4546 | 1.529 |
| *Acetabularia* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9605 | 0.0732 | 0.9605 | 0.6861 | 0.5946 | 0.2744 | 0.222 |
| *Seagrass epiphytes* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0991 | 0.0000 | 0.0000 | 0.006 |
|  | **8.3609** | **15.7575** | **17.5138** | **24.7235** | **4.7801** | **15.8139** | **34.0571** | **9.8007** | **23.0742** | **24.8049** | **3.2276** | **2.2530** | **2.6330** | **2.1020** | **1.0714** | **4.7855** | **12.172** |

**Bare sand/sparse algal habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 0.0000 | 0.0000 | 0.2363 | 0.7055 | 0.2048 | 0.0000 | 0.0000 | 0.0000 | 1.6066 | 0.3544 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.194 |
| *Penicillus capitatus.* | 0.0849 | 0.5303 | 0.0499 | 0.0385 | 0.5295 | 0.0000 | 0.3346 | 0.1882 | 0.0737 | 0.1352 | 0.8413 | 7.4563 | 1.1020 | 0.6055 | 0.4877 | 3.0464 | 0.969 |
| *Penicillus dumetosus* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Udotea cyathiformis* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Udotea flabellum* | 0.0000 | 0.0000 | 0.0000 | 0.4424 | 1.0303 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9932 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0512 | 0.157 |
| *Rhipocephalus spp.* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.6068 | 0.4017 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.126 |
| *Acetabularia* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Seagrass epiphytes* | 1.0408 | 1.2390 | 0.9416 | 1.1399 | 0.2974 | 0.2478 | 0.2974 | 0.0000 | 0.7434 | 0.1982 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0408 | 0.449 |
|  | **1.1256** | **1.7693** | **1.2278** | **2.3263** | **2.0619** | **1.8546** | **1.0337** | **0.1882** | **2.4237** | **1.6810** | **0.8413** | **7.4563** | **1.1020** | **0.6055** | **0.4877** | **4.1384** | **1.895** |

**Sparse seagrass habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 1.1816 | 1.7614 | 0.1247 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1040 | 0.6458 | 1.7632 | 0.0000 | 0.0000 | 2.7097 | 1.6101 | 1.2890 | 0.699 |
| *Penicillus capitatus.* | 0.2473 | 0.0000 | 0.0000 | 1.4968 | 0.0554 | 0.0000 | 0.1469 | 1.0573 | 0.0000 | 1.1577 | 0.8744 | 0.1150 | 1.6656 | 0.3349 | 0.0000 | 0.1111 | 0.454 |
| *Penicillus dumetosus* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Udotea cyathiformis* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.5158 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.032 |
| *Udotea flabellum* | 0.0000 | 0.0000 | 0.5301 | 0.2813 | 0.1115 | 0.8145 | 0.4034 | 0.8354 | 0.0226 | 0.7576 | 1.0599 | 1.0318 | 0.2666 | 0.0000 | 0.0000 | 0.1594 | 0.392 |
| *Rhipocephalus spp.* | 0.0000 | 0.0000 | 6.4674 | 9.1588 | 2.0085 | 2.8119 | 0.3615 | 2.5307 | 0.0000 | 0.0000 | 0.0000 | 4.4187 | 0.4017 | 0.0000 | 0.0000 | 1.2051 | 1.835 |
| *Acetabularia* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Seagrass epiphytes* | 9.5580 | 10.2377 | 9.4730 | 3.7382 | 6.7543 | 5.0551 | 5.9897 | 6.3295 | 6.8393 | 5.9047 | 4.4604 | 5.0976 | 0.9770 | 6.6906 | 11.4696 | 3.6108 | 6.387 |
|  | **10.9869** | **11.9991** | **16.5953** | **14.6752** | **8.9298** | **9.1973** | **6.9015** | **10.7530** | **6.9658** | **8.4658** | **8.1578** | **10.6631** | **3.3110** | **9.7352** | **13.0797** | **6.3754** | **9.799** |

**Medium seagrass habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 1.2081 | 1.5121 | 0.6261 | 2.2618 | 3.5894 | 2.4018 | 0.8505 | 3.1107 | 6.6645 | 4.6963 | 2.0870 | 1.4290 | 9.7041 | 5.8201 | 5.5954 | 7.7060 | 3.704 |
| *Penicillus capitatus.* | 1.3828 | 1.6160 | 0.4584 | 6.1818 | 0.7846 | 0.9669 | 6.7226 | 2.3424 | 1.8504 | 0.0000 | 0.3565 | 0.0000 | 1.1061 | 0.0000 | 0.3354 | 2.5295 | 1.665 |
| *Penicillus dumetosus* | 0.0000 | 0.0000 | 0.0000 | 0.2412 | 0.0000 | 0.0000 | 0.0000 | 0.7199 | 0.0000 | 0.0000 | 7.9961 | 0.0000 | 0.0843 | 0.0000 | 0.0000 | 0.0000 | 0.565 |
| *Udotea cyathiformis* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 8.7228 | 0.9465 | 0.6601 | 6.8860 | 0.0000 | 2.2223 | 0.0000 | 1.9136 | 1.334 |
| *Udotea flabellum* | 0.6957 | 0.0000 | 0.0000 | 1.0415 | 1.1082 | 0.0000 | 0.5722 | 0.0000 | 2.9118 | 0.4516 | 5.0085 | 1.3787 | 4.4417 | 4.8574 | 0.0000 | 2.8173 | 1.580 |
| *Rhipocephalus spp.* | 2.9324 | 4.8204 | 3.4546 | 7.7126 | 5.3828 | 0.5624 | 4.1777 | 1.2051 | 1.2051 | 1.2051 | 3.6153 | 0.8034 | 2.2495 | 8.5160 | 1.6871 | 3.6153 | 3.322 |
| *Acetabularia* | 0.3659 | 0.0000 | 0.0000 | 0.5031 | 0.4116 | 0.7318 | 1.6008 | 0.3659 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.249 |
| *Seagrass epiphytes* | 46.1616 | 61.8509 | 70.1203 | 42.3667 | 68.5344 | 61.0296 | 63.4368 | 89.8310 | 45.0288 | 63.5784 | 47.7192 | 68.5344 | 49.7016 | 37.3824 | 37.9488 | 40.8374 | 55.879 |
|  | **52.7465** | **69.7993** | **74.6594** | **60.3089** | **79.8110** | **65.6924** | **77.3607** | **97.5751** | **66.3834** | **70.8780** | **67.4428** | **79.0316** | **67.2873** | **58.7982** | **45.5667** | **59.4191** | **68.298** |

**Dense seagrass habitat**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **g CaCO3 m-2 yr-1** | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** | **T8** | **T9** | **T10** | **T11** | **T12** | **T13** | **T14** | **T15** | **T16** | **AVERAGE** |
| *Halimeda spp.* | 0.7773 | 1.3467 | 3.6699 | 2.0554 | 3.9855 | 9.6456 | 8.0195 | 4.8945 | 5.0488 | 6.1663 | 0.9765 | 1.8113 | 0.1890 | 1.2049 | 0.9011 | 1.4054 | 3.256 |
| *Penicillus capitatus.* | 0.0000 | 0.0000 | 0.2275 | 0.0000 | 0.1119 | 0.0000 | 0.0776 | 34.8484 | 0.0000 | 0.3814 | 0.0000 | 0.0000 | 0.0000 | 0.1215 | 0.0000 | 0.0000 | 2.236 |
| *Penicillus dumetosus* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.3116 | 0.0000 | 1.0891 | 10.5941 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.750 |
| *Udotea cyathiformis* | 0.1451 | 0.0000 | 0.0000 | 0.6339 | 1.3095 | 1.2302 | 13.4532 | 0.0000 | 0.0000 | 0.0000 | 3.7784 | 0.0000 | 0.0000 | 0.0000 | 1.7268 | 0.0000 | 1.392 |
| *Udotea flabellum* | 2.0081 | 1.2050 | 1.0507 | 1.4303 | 0.0900 | 2.8291 | 2.2909 | 1.7864 | 0.2680 | 2.9154 | 0.0000 | 2.1367 | 0.0000 | 0.5323 | 0.0000 | 1.9281 | 1.279 |
| *Rhipocephalus spp.* | 0.0000 | 0.0000 | 0.0000 | 1.2854 | 0.0000 | 15.7466 | 0.0000 | 0.0000 | 0.0000 | 1.4060 | 0.0000 | 0.0000 | 0.0000 | 1.6068 | 0.0000 | 3.9367 | 1.499 |
| *Acetabularia* | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.000 |
| *Seagrass epiphytes* | 286.740 | 278.138 | 255.517 | 204.541 | 242.136 | 259.978 | 262.526 | 123.235 | 136.871 | 125.911 | 261.571 | 212.825 | 207.982 | 265.075 | 272.722 | 249.782 | 227.847 |
| ***Total*** | **289.671** | **280.689** | **260.465** | **209.946** | **247.633** | **289.741** | **286.368** | **165.853** | **152.782** | **136.780** | **266.326** | **216.773** | **208.171** | **268.541** | **275.349** | **257.053** | **238.259** |