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# Appendix 1 – Spatial Range of TTL dataset (Ch 2)

The following data are tabulated raw data from the study of spatial patterns in TTL (described in Chapter 2). Each measurement represents the average of 3 separate samples taken from study colonies. Sample preparation and TTL measurement are described in detail in Chapter 2.

| Location | Date | Label | Average | SD |
|---|---|---|---|---|
| **Palm region - misc. reefs** | | | | |
| Pandora reef | Sep-97 | PIPR 1-1 | 5.033333 | 0.273252 |
| | | PIPR 1-2 | 3.966667 | 0.355903 |
| | | PIPR 1-3 | 5.483333 | 0.248328 |
| | | PIPR 1-4 | 7.283333 | 0.231661 |
| | | PIPR 1-5 | 5.9 | 0.282843 |
| | | PIPR 1-6 | 5.383333 | 0.248328 |
| | | PIPR 1-7 | 7.05 | 0.197484 |
| | | PIPR 1-8 | 6.95 | 0.301662 |
| Fantome Is | Sep-97 | PIFI 1-1 | 5.016667 | 0.183485 |
| | | PIFI 1-2 | 3.7 | 0.389872 |
| | | PIFI 1-3 | 3.1 | 0.485798 |
| | | PIFI 1-4 | 3.516667 | 0.411906 |
| | | PIFI 1-5 | 3.633333 | 0.136626 |
| | | PIFI 1-6 | 4.483333 | 0.348807 |
| Orpheus Is | Sep-97 | PB01 | 3.764831 | 0.505137 |
| | | PB02 | 3.805586 | 0.439838 |
| | | PB03 | 3.226175 | 0.732222 |
| | | PB04 | 3.343586 | 0.606386 |
| | | PB05 | 3.471175 | 0.396667 |
| | | PB06 | 4.18987 | 0.363433 |
| | | PB07 | 4.402406 | 0.23988 |
| | | PB08 | 3.96293 | 0.408621 |
| | | PB09 | 3.982285 | 0.367895 |
| | | PB10 | 3.947365 | 0.265726 |

| Location | Date | Label | Average | SD |
|---|---|---|---|---|
| **Whitsunday region - misc. reefs** | | | | |
| Deloraine Is | 7/8/1997 | WDI 1-1 | 5.083333 | 0.194079 |
| | | WDI 1-2 | 4.816667 | 0.318852 |
| | | WDI 1-3 | | |
| | | WDI 1-4 | 5.266667 | 0.206559 |
| | | WDI 1-5 | 4.966667 | 0.258199 |
| | | WDI 1-6 | | |
| | | WDI 1-7 | 7.316667 | 0.507609 |
| Double Cone Is | 14/8/1997 | WDCI 1-1 | 5.566667 | 0.273252 |
| | | WDCI 1-2 | 5.366667 | 0.294392 |
| | | WDCI 1-3 | | |
| | | WDCI 1-4 | 5.8 | 0.316228 |
| | | WDCI 1-5 | | |
| | | WDCI 1-6 | 5.083333 | 0.598052 |
| Lupton Is | 12/8/1997 | WLI 3-1 | 5.766667 | 0.314113 |
| | | WLI 3-2 | 6.583333 | 0.285774 |
| | | WLI 3-3 | 7.2 | 0.178885 |
| | | WLI 3-4 | 6.85 | 0.372827 |
| | | WLI 3-5 | 6.7 | 0.447214 |
| | 8/8/1997 | WLI 2-1 | 5.683333 | 0.348807 |
| Double Is | Aug-97 | WDbI 1-1 | 7.35 | 0.546809 |
| | | WDbI 1-2 | 6.066667 | 0.314113 |
| | | WDbI 1-3 | 5.166667 | 0.273252 |
| | | WDbI 1-4 | 5.65 | 0.388587 |
| | | WDbI 1-5 | 8.2 | 0.063246 |
| | | WDbI 1-6 | 7.933333 | 0.34448 |
| Border IS | 7/8/1997 | WBI 1-1 | 5.216667 | 0.204124 |
| | | WBI 1-2 | 4.9 | 0.252982 |
| | | WBI 1-3 | 3.783333 | 0.194079 |
| | | WBI 1-4 | 5.683333 | 0.183485 |
| | | WBI 1-5 | 7.1 | 0.4 |
| | | WBI 1-6 | 7.583333 | 0.371035 |
| Hook Is - West | 12/8/1997 | WHIFN 1-1 | 5.016667 | 0.132916 |
| | | WHIFN 1-2 | 4.466667 | 0.34448 |
| | | WHIFN 1-3 | 4.55 | 0.288097 |
| | | WHIFN 1-4 | 5.133333 | 0.36697 |
| | | WHIFN 1-5 | 5.116667 | 0.213698 |
| | | WHIFN 1-6 | 4.25 | 0.288097 |
| | | WHIFN 1-7 | 5.1 | 0.167332 |
| | | WHIFN 1-8 | 4.616667 | 0.194079 |
| Hook Is - East | 6/8/1997 | WHI 1-1 | 9.033333 | 0.432049 |
| | | WHI 1-2 | 7.666667 | 0.216025 |
| | | WHI 1-3 | 6.116667 | 0.263944 |
| | | WHI 1-4 | 5.916667 | 0.292689 |
| | | WHI 1-5 | 5.5 | 0.209762 |
| | | WHI 1-6 | 6.4 | 0.309839 |

| Location | Date | Label | Average | SD |
|---|---|---|---|---|
| **Far Northern region - misc. reefs** | | | | |
| | | | 4.26666 | |
| GBR-15-1072 REEF | Sep-97 | FN072 1-1 | 7 | 0.393277 |
| | Sep-97 | FN072 1-2 | 5.25 | 0.234521 |
| | Sep-97 | FN072 1-3 | 5.5 | 0.252982 |
| | Sep-97 | FN072 1-4 | 5.25 | 0.314643 |
| | Sep-97 | FN072 1-5 | 5.2 | 0.303315 |
| | Sep-97 | FN072 1-6 | 5.75 | 0.151658 |
| GBR 14-1039 | Sep-97 | UNLABELED 1 | 4.75 | 0.13784 |
| | Sep-97 | UNLABELED 2 | 5.783333 | 0.312517 |
| | Sep-97 | UNLABELED 3 | 5.7 | 0.154919 |
| | Sep-97 | UNLABELED 4 | 5.45 | 0.320936 |
| ARLINGTON REEF | Sep-97 | FNAR 1-1 | 4.316667 | 0.263944 |
| | Sep-97 | FNAR 1-2 | 5.416667 | 0.213698 |
| | Sep-97 | FNAR 1-3 | 5.383333 | 0.360093 |
| | Sep-97 | FNAR 1-4 | 6.116667 | 0.426224 |
| | Sep-97 | FNAR 1-5 | 5.3 | 0.374166 |
| | Sep-97 | FNAR 1-6 | 5.133333 | 0.121106 |
| HARRIER REEF | Sep-97 | FNHR 1-1 | 5.75 | 0.383406 |
| | Sep-97 | FNHR 1-2 | 5.183333 | 0.392003 |
| | Sep-97 | FNHR 1-3 | 5.166667 | 0.150555 |
| | Sep-97 | FNHR 1-4 | 4.433333 | 0.332666 |
| | Sep-97 | FNHR 1-5 | 4.75 | 0.242899 |
| NO NAME REEF | Sep-97 | FNNN 1-1 | 5.666667 | 0.250333 |
| | Sep-97 | FNNN 1-2 | 5.846667 | 0.184029 |
| | Sep-97 | FNNN 1-3 | 5.4 | 0.178885 |
| | Sep-97 | FNNN 1-4 | 5.766667 | 0.432049 |
| | Sep-97 | FNNN 1-5 | 5.333333 | 0.233809 |
| LIZARD ISLAND | Sep-97 | LZI 1-1 | 4.95 | 0.350714 |
| | Sep-97 | LZI 1-2 | 5.916667 | 0.741395 |
| | Sep-97 | LZI 1-3 | 5.416667 | 0.183485 |
| | Sep-97 | LZI 1-4 | 4.766667 | 0.393277 |
| | Sep-97 | LZI 1-5 | 4.916667 | 0.213698 |
| | Sep-97 | LZI 1-6 | 5.833333 | 0.838252 |
| | Sep-97 | LZI 1-7 | 5.483333 | 0.312517 |
| | Sep-97 | LZI 1-8 | 4.483333 | 0.22286 |
| | Sep-97 | LZI 1-9 | 5.683333 | 0.263944 |
| | Sep-97 | LZI 1-10 | 4.75 | 0.273861 |

| Location | Date | Label | Average | SD |
|---|---|---|---|---|
| **Far Northern region - misc. reefs** | | | | |
| OSPREY REEF(CORAL SEA) | Sep-97 | FNORE 1-1 | 5.8 | 0.167332 |
| | Sep-97 | FNORE 1-4 | 5.516667 | 0.248328 |
| | Sep-97 | FNORE 1-5 | 4.916667 | 0.231661 |
| | Sep-97 | FNORE 1-6 | 4.333333 | 0.307679 |
| | | | | |
| Moulter Cay | Dec-97 | MC1-1 | 6.133333 | 0.11547 |
| | Dec-97 | MC1-2 | 10.1 | 0.1 |
| | Dec-97 | MC1-3 | 8.333333 | 0.351188 |
| | Dec-97 | MC1-4 | 5.166667 | 0.152753 |
| | Dec-97 | MC1-5 | 7.666667 | 0.450925 |
| | Dec-97 | MC1-6 | 5.733333 | 0.46188 |
| | | | | |
| RAINE ISLAND | NOV-DEC 97 | RI3 | 5.05 | 0.070711 |
| | NOV-DEC 97 | RI3#1 | 4.366667 | 0.208167 |
| | NOV-DEC 97 | RI3#2 | 5.666667 | 0.208167 |
| | NOV-DEC 97 | RI3#4 | 4.166667 | 0.057735 |
| | NOV-DEC 97 | RI3#5 | 6.866667 | 0.251661 |
| | | | | |
| | NOV-DEC 97 | RNI 1-1 | 6.483333 | 0.189 |
| | NOV-DEC 97 | RNI 1-2 | 4.866667 | 0.305505 |
| | NOV-DEC 97 | RNI 1-3 | 8.216667 | 0.028868 |
| | NOV-DEC 97 | RNI 1-4 | 4.9 | 0.2 |
| | NOV-DEC 97 | RNI 1-5 | 4.2 | 0.360555 |
| | NOV-DEC 97 | RNI 1-6 | 4.916667 | 0.104083 |
| | NOV-DEC 97 | RNI 1-7 | 5.8 | 0.52915 |
| | | | | |
| McLennan Cay | Nov-97 | A | 4.6 | 0.173205 |
| | Nov-97 | B | 6.566667 | 0.11547 |
| | Nov-97 | C | 5.033333 | 0.208167 |
| | Nov-97 | D | 6.333333 | 0.152753 |
| | Nov-97 | E | 5.533333 | 0.305505 |

| Location | Date | Label | Average | SD |
|---|---|---|---|---|
| **Gulf of Thailand - misc. reefs** | | | | |
| Ko Matrah | Aug-03 | KM 1 | 7.8 | 0.916515 |
| | | KM 2 | 9.633333 | 0.321455 |
| | | KM 3 | 7.766667 | 0.378594 |
| | | KM 4 | 7.166667 | 0.288675 |
| | | KM 5 | 6.033333 | 0.550757 |
| | | KM 6 | 7.9 | 0.360555 |
| Ko Ratchiajiew | Aug-03 | KR 1 | 5.433333 | 0.208167 |
| | | KR 2 | 5.933333 | 0.11547 |
| | | KR 3 | 8.966667 | 0.251661 |
| | | KR 4 | 8.566667 | 0.51316 |
| | | KR 5 | 6.8 | 0.6 |
| | | KR 6 | 8.633333 | 0.351188 |
| | | KR 7 | 7.133333 | 0.61101 |
| | | KR 8 | 7.166667 | 0.152753 |
| **Pratchuap Kiri Kan** | | | | |
| Ko Singha | Aug-03 | KS1 -1 | 5.466667 | 0.152753 |
| | | KS1 -2 | 4.8 | 0.173205 |
| | | KS1 -3 | 5.6 | 0.173205 |
| | | KS1 -4 | 4.4 | 0.360555 |
| | | KS1 -5 | 4.566667 | 0.550757 |
| | | KS1 -6 | 6.266667 | 0.680686 |
| | | KS1 -7 | 5.5 | 0.5 |
| Ko Sung | Aug-03 | KS2 -1 | 10.03333 | 0.680686 |
| | | KS2 -2 | 7.266667 | 0.416333 |
| | | KS2 -3 | 4.566667 | 0.321455 |
| | | KS2 -4 | 4.933333 | 0.11547 |
| | | KS2 -5 | 6.1 | 0.360555 |
| | | KS2 -6 | 5.366667 | 0.321455 |
| | | KS2 -7 | 5.633333 | 0.152753 |
| | | KS2 -8 | 5.9 | 0.360555 |

**TTL measurements from colonies used in the long-term study of Chapter 2.**

Location = Pioneer Bay, Orpheus Island, Great Barrier Reef, Australia (18°37'S 146°23'E). Measurements listed are the mean of 3 TTL readings of each of 3 samples taken from the upper surface of a colony.

| Label | Species | Oct-94 | SE | Nov-94 | SE | Dec-94 | SE | Jan-95 | SE | Feb-95 | SE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB01 | *australiensis* | 3.430 | 0.049 | 3.615 | 0.060 | 3.942 | 0.051 | 3.638 | 0.061 | 3.931 | 0.108 |
| PB02 | *australiensis* | 3.680 | 0.066 | 3.964 | 0.083 | 3.071 | 0.077 | 3.479 | 0.054 | 3.441 | 0.067 |
| PB03 | *australiensis* | 3.114 | 0.065 | 3.365 | 0.077 | 3.539 | 0.055 | 3.230 | 0.075 | 3.223 | 0.060 |
| PB04 | *australiensis* | 3.593 | 0.099 | 3.582 | 0.059 | 3.278 | 0.080 | 3.309 | 0.066 | 3.506 | 0.103 |
| PB05 | *australiensis* | 3.680 | 0.073 | 3.768 | 0.052 | 3.822 | 0.054 | 4.409 | 0.087 | 4.356 | 0.099 |
| PB06 | *lobata* | 4.040 | 0.027 | 4.715 | 0.053 | 4.018 | 0.046 | 4.046 | 0.082 | 4.290 | 0.105 |
| PB07 | *lobata* | 5.063 | 0.193 | 4.181 | 0.037 | 4.519 | 0.097 | 4.681 | 0.113 | 5.640 | 0.145 |
| PB08 | *australiensis* | 4.160 | 0.047 | 4.660 | 0.110 | 5.477 | 0.105 | 4.975 | 0.073 | 5.281 | 0.059 |
| PB09 | *australiensis* | 4.323 | 0.113 | 4.040 | 0.056 | 4.606 | 0.135 | 3.615 | 0.065 | 3.561 | 0.081 |
| PB10 | *lobata* | 4.377 | 0.103 | 4.007 | 0.058 | 4.475 | 0.154 | 5.021 | 0.091 | 4.693 | 0.087 |

| | | Mar-95 | SE | Jun-95 | SE | Sep-95 | SE | Dec-95 | SE | Jul-96 | SE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB01 | *australiensis* | 3.876 | 0.096 | 3.200 | 0.115 | 4.015 | 0.163 | 3.432 | 0.052 | 3.067 | 0.134 |
| PB02 | *australiensis* | 3.397 | 0.098 | 3.967 | 0.120 | 4.731 | 0.067 | 3.569 | 0.293 | 3.158 | 0.181 |
| PB03 | *australiensis* | 3.343 | 0.037 | 3.900 | 0.100 | 4.338 | 0.131 | 3.273 | 0.096 | 2.767 | 0.125 |
| PB04 | *australiensis* | 3.506 | 0.079 | 4.000 | 0.153 | 4.671 | 0.180 | 4.517 | 0.222 | 2.375 | 0.200 |
| PB05 | *australiensis* | 3.855 | 0.110 | 4.367 | 0.120 | | 0.000 | 4.178 | 0.052 | 3.217 | 0.129 |
| PB06 | *lobata* | 4.987 | 0.079 | 4.467 | 0.088 | 3.026 | 0.208 | 5.017 | 0.105 | 2.993 | 0.113 |
| PB07 | *lobata* | 4.954 | 0.104 | 4.300 | 0.208 | 4.900 | 0.208 | 5.117 | 0.114 | 3.289 | 0.226 |
| PB08 | *australiensis* | 5.020 | 0.141 | 4.067 | 0.120 | 4.633 | 0.095 | 4.474 | 0.117 | 3.668 | 0.457 |
| PB09 | *australiensis* | 3.724 | 0.087 | 3.467 | 0.260 | 4.083 | 0.120 | 4.600 | 0.100 | 3.067 | 0.151 |
| PB10 | *lobata* | 4.377 | 0.140 | 3.900 | 0.058 | 3.850 | 0.083 | 3.503 | 0.135 | 3.633 | 0.258 |

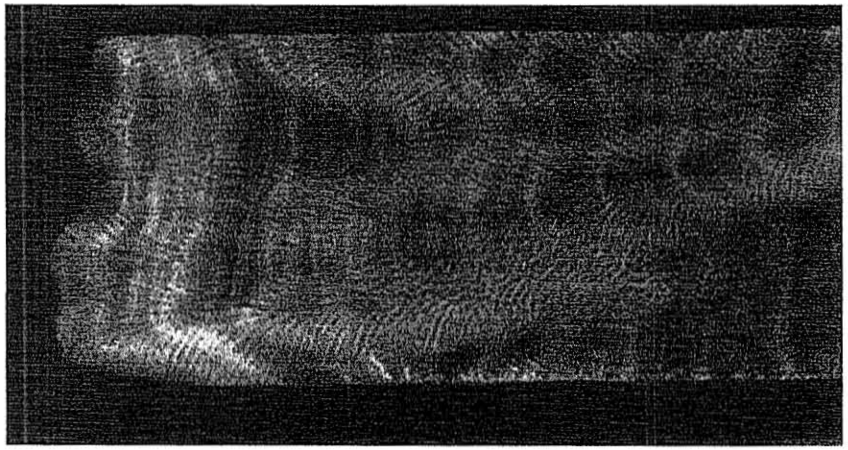


**Figure 1 X-ray image of unshaded coral PB01**

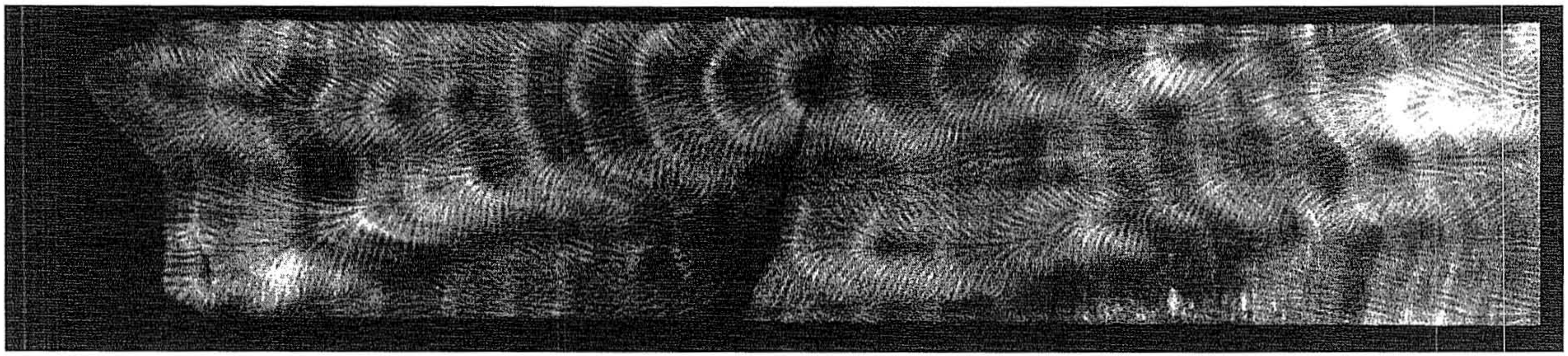


**Figure 2 X-ray image of study core from shaded coral PBS04**

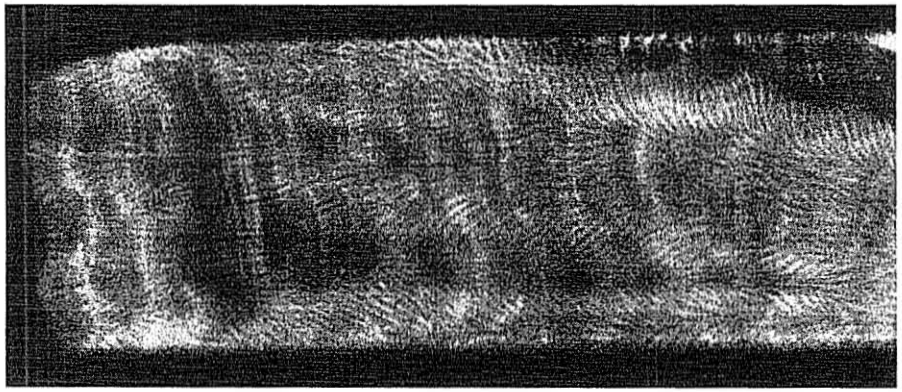
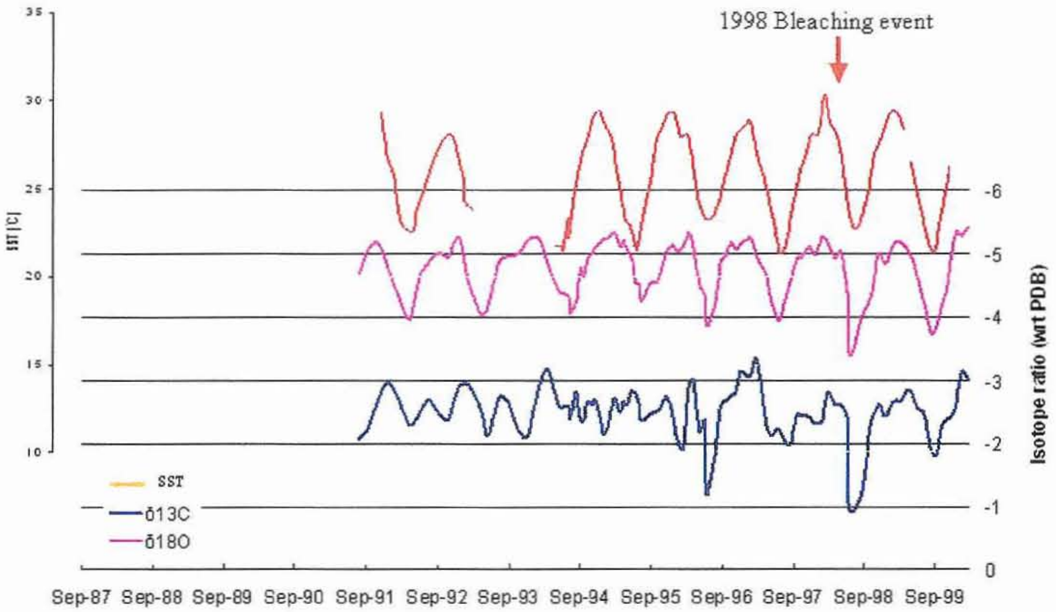
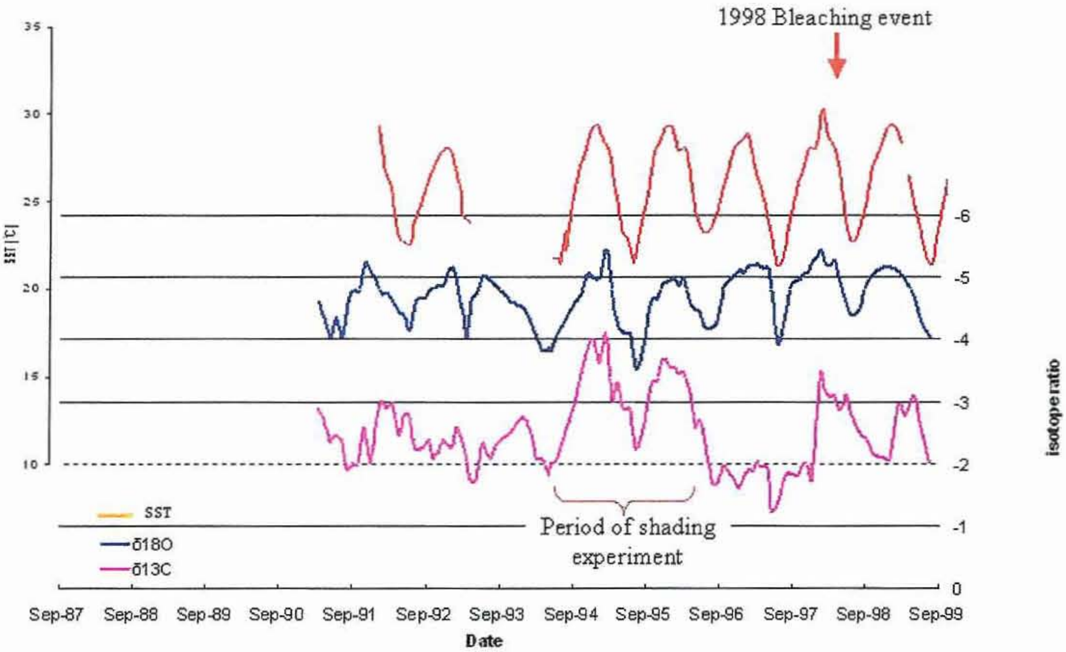


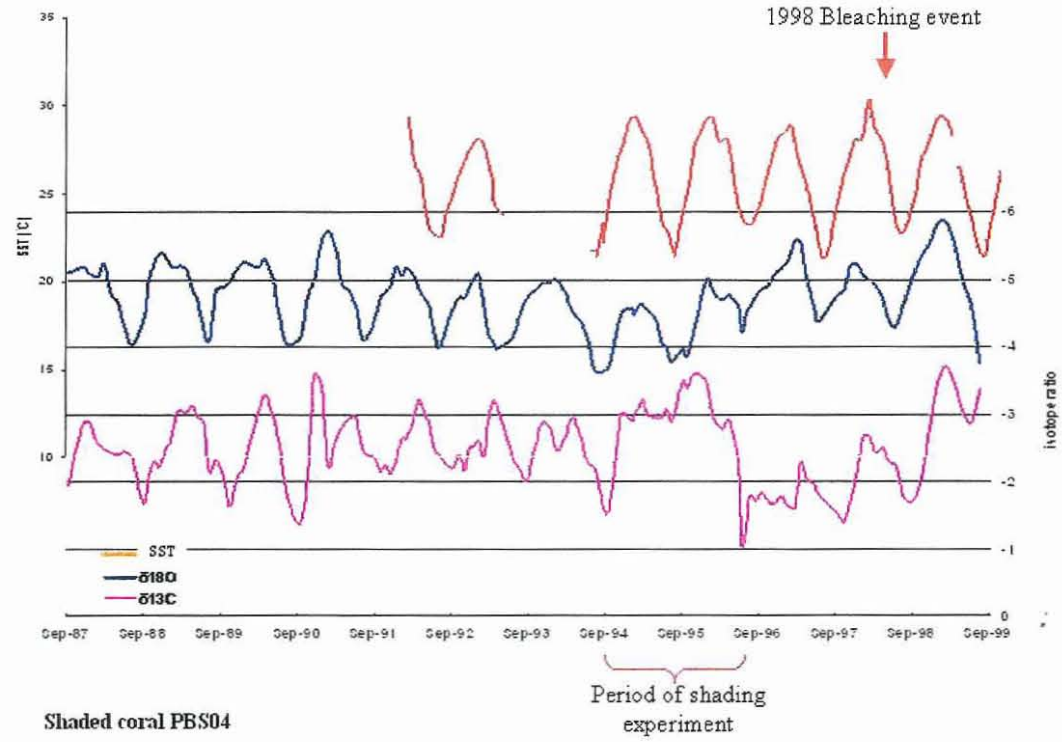
**Figure 3 X-ray image of study core from shaded coral PBS01**




Unshaded coral PB01 – comparison with instrumental records of environmental variation




**Shaded coral PBS01**




**Shaded coral PBS04**

## 1. Shaded Corals

| coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ | coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|---|---|---|---|
| PBSO4 | 1 | -3.36 | -3.74 | PBSO1 | 1 | -2.017 | -4.0316 |
| PBSO4 | 5 | -2.87 | -4.61 | PBSO1 | 5 | -2.5602 | -4.2444 |
| PBSO4 | 9 | -3.02 | -4.96 | PBSO1 | 10 | -3.0976 | -4.6567 |
| PBSO4 | 13 | -3.45 | -5.53 | PBSO1 | 13 | -2.7715 | -4.925 |
| PBS04 | 17 | -3.70 | -5.86 | PBSO1 | 17 | -2.9426 | -5.0858 |
| PBSO4 | 21 | -3.52 | -5.82 | PBSO1 | 21 | -2.078 | -5.1562 |
| PBSO4 | 25 | -2.81 | -5.53 | PBSO1 | 25 | -2.1167 | -5.1524 |
| PBSO4 | 29 | -2.02 | -5.32 | PBSO1 | 29 | -2.1437 | -5.0662 |
| PBSO4 | 33 | -1.71 | -5.02 | PBSO1 | 33 | -2.4005 | -4.8872 |
| PBSO4 | 37 | -1.75 | -4.64 | PBSO1 | 37 | -2.5227 | -4.4861 |
| PBSO4 | 41 | -2.25 | -4.30 | PBSO1 | 41 | -2.8324 | -4.3891 |
| PBSO4 | 46 | -2.2895 | -4.3963 | PBSO1 | 45 | -3.1089 | -4.555 |
| PBS04 | 48 | -2.5049 | -4.7234 | PBSO1 | 49 | -2.9072 | -4.7599 |
| PBS04 | 52 | -2.4188 | -4.8834 | PBSO1 | 53 | -2.898 | -4.9787 |
| PBSO4 | 53 | -2.6513 | -4.9754 | PBSO1 | 57 | -3.1101 | -5.2672 |
| PBSO4 | 57 | -2.6741 | -5.053 | PBSO1 | 61 | -3.0728 | -5.1749 |
| PBSO4 | 61 | -2.113 | -5.2216 | PBSO1 | 65 | -3.1774 | -5.2207 |
| PBS04 | 63 | -1.7053 | -5.1986 | PBSO1 | 69 | -3.4712 | -5.4259 |
| PBSO4 | 67 | -1.3956 | -4.8265 | PBSO1 | 71 | -2.57 | -5.32 |
| PBSO4 | 69 | -1.523 | -4.7646 | PBSO1 | 73 | -1.746 | -5.2425 |
| PBSO4 | 73 | -1.8156 | -4.3745 | PBSO1 | 75 | -1.98 | -5.09 |
| PBSO4 | 78 | -1.9597 | -4.602 | PBSO1 | 77 | -1.9889 | -5.0486 |
| PBSO4 | 81 | -2.0371 | -4.9916 | PBSO1 | 79 | -1.83 | -4.95 |
| PBS04 | 85 | -2.2961 | -5.5548 | PBSO1 | 81 | -1.8153 | -4.9374 |
| PBS04 | 89 | -1.6199 | -5.5787 | PBSO1 | 83 | -1.85 | -4.85 |
| PBSO4 | 93 | -1.6367 | -5.2679 | PBSO1 | 87 | -1.82 | -4.45 |
| PBSO4 | 95 | -1.7702 | -5.1499 | PBSO1 | 91 | -1.32 | -3.93 |
| PBSO4 | 97 | -1.6654 | -5.0573 | PBSO1 | 95 | -1.24 | -4.63 |
| PBS04 | 99 | -1.7035 | -4.9075 | PBSO1 | 99 | -1.91 | -5.14 |
| PBSO4 | 101 | -1.8342 | -4.8463 | PBSO1 | 99 | -1.95 | -5.14 |
| PBS04 | 103 | -1.7041 | -4.738 | PBSO1 | 101 | -2.03 | -5.20 |
| PBSO4 | 105 | -1.7889 | -4.5699 | PBSO1 | 103 | -1.88 | -5.18 |
| PBSO4 | 107 | -1.3124 | -4.5172 | PBSO1 | 105 | -1.89 | -5.18 |
| PBSO4 | 109 | -1.0549 | -4.2071 | PBSO1 | 109 | -1.72 | -5.06 |
| PBSO4 | 111 | -2.2486 | -4.6042 | PBSO1 | 113 | -1.61 | -5.11 |
| PBS04 | 112 | -2.5905 | -4.6692 | PBSO1 | 117 | -1.79 | -5.01 |
| PBSO4 | 113 | -2.9181 | -4.7619 | PBSO1 | 121 | -1.88 | -4.95 |
| PBSO4 | 115 | -2.7818 | -4.6824 | PBSO1 | 125 | -1.97 | -4.85 |
| PBS04 | 116 | -2.9741 | -4.838 | PBSO1 | 129 | -1.70 | -4.43 |
| PBSO4 | 117 | -3.3628 | -5.003 | PBSO1 | 133 | -1.66 | -4.21 |
| PBSO4 | 119 | -3.5493 | -4.8254 | PBSO1 | 139 | -2.48 | -4.20 |
| PBSO4 | 121 | -3.5944 | -4.1796 | PBSO1 | 140 | -2.70 | -4.43 |
| PBSO4 | 123 | -3.3791 | -3.8606 | PBSO1 | 141 | -2.59 | -4.48 |
| PBS04 | 124 | -3.4995 | -3.9606 | PBSO1 | 143 | -3.09 | -4.53 |
| PBSO4 | 125 | -2.8953 | -3.771 | PBSO1 | 144 | -3.30 | -4.74 |
| PBSO4 | 127 | -3.0689 | -3.9775 | PBSO1 | 145 | -3.48 | -4.98 |
| PBS04 | 128 | -2.9483 | -4.0633 | PBSO1 | 147 | -3.45 | -4.85 |
| PBSO4 | 129 | -2.9551 | -4.3642 | PBSO1 | 148 | -3.55 | -4.96 |

## 1. Shaded Corals

| coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ | coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|---|---|---|---|
| PBSO4 | 133 | -3.153 | -4.6342 | PBSO1 | 149 | -3.66 | -4.93 |
| PBSO4 | 135 | -2.9621 | -4.4743 | PBSO1 | 151 | -3.65 | -4.87 |
| PBS04 | 136 | -2.9009 | -4.568 | PBSO1 | 152 | -3.33 | -4.67 |
| PBS04 | 137 | -3.001 | -4.4888 | PBSO1 | 152 | -3.33 | -4.67 |
| PBS04 | 140 | -1.5386 | -3.6876 | PBSO1 | 153 | -3.09 | -4.49 |
| PBSO4 | 141 | -2.197 | -3.6422 | PBSO1 | 157 | -2.63 | -3.99 |
| PBS04 | 144 | -2.2942 | -4.137 | PBSO1 | 161 | -2.24 | -3.52 |
| PBSO4 | 145 | -2.6909 | -4.3885 | PBSO1 | 163 | -2.87 | -4.09 |
| PBSO4 | 149 | -2.9513 | -4.5215 | PBSO1 | 163 | -2.87 | -4.09 |
| PBSO4 | 153 | -2.6486 | -4.8054 | PBSO1 | 165 | -3.31 | -4.25 |
| PBS04 | 157 | -2.47 | -4.9753 | PBSO1 | 167 | -3.02 | -4.67 |
| PBS04 | 161 | -2.8133 | -4.9572 | PBSO1 | 169 | -4.09 | -5.44 |
| PBS04 | 165 | -2.8785 | -4.9449 | PBSO1 | 171 | -3.61 | -5.00 |
| PBSO4 | 169 | -2.4986 | -4.8317 | PBSO1 | 173 | -4.01 | -4.99 |
| PBSO4 | 173 | -2.0207 | -4.7334 | PBSO1 | 175 | -3.81 | -5.05 |
| PBSO4 | 177 | -2.1701 | -4.4748 | PBSO1 | 177 | -3.40 | -4.73 |
| PBSO4 | 181 | -2.3579 | -4.1411 | PBSO1 | 179 | -2.99 | -4.61 |
| PBSO4 | 185 | -3.0892 | -3.9721 | PBSO1 | 181 | -2.71 | -4.45 |
| PBSO4 | 189 | -3.2012 | -4.0601 | PBSO1 | 183 | -2.06 | -4.09 |
| PBSO4 | 193 | -2.8798 | -4.2108 | PBSO1 | 185 | -2.00 | -3.81 |
| PBSO4 | 197 | -2.3668 | -4.629 | PBSO1 | 187 | -1.83 | -3.85 |
| PBSO4 | 201 | -2.6077 | -5.0666 | PBSO1 | 189 | -2.06 | -3.81 |
| PBS04 | 205 | -2.5258 | -4.9921 | PBSO1 | 191 | -2.09 | -4.01 |
| PBSO4 | 209 | -2.488 | -4.858 | PBSO1 | 193 | -2.54 | -4.25 |
| PBSO4 | 213 | -2.1692 | -4.7235 | PBSO1 | 195 | -2.75 | -4.50 |
| PBS04 | 217 | -2.3951 | -4.7264 | PBSO1 | 195 | -2.75 | -4.50 |
| PBS04 | 221 | -2.2046 | -4.5299 | PBSO1 | 197 | -2.50 | -4.59 |
| PBS04 | 225 | -2.3929 | -3.9963 | PBSO1 | 199 | -2.43 | -4.73 |
| PBS04 | 229 | -2.4707 | -4.1716 | PBSO1 | 199 | -2.43 | -4.73 |
| PBS04 | 233 | -2.8427 | -4.5987 | PBSO1 | 201 | -2.31 | -4.84 |
| PBS04 | 237 | -3.0349 | -4.7222 | PBSO1 | 205 | -2.10 | -4.94 |
| PBS04 | 241 | -3.2125 | -4.8578 | PBSO1 | 209 | -2.32 | -5.02 |
| PBS04 | 245 | -2.9285 | -5.0637 | PBSO1 | 217 | -1.73 | -4.76 |
| PBS04 | 249 | -2.6424 | -5.1607 | PBSO1 | 221 | -1.74 | -4.59 |
| PBSO4 | 253 | -2.6416 | -5.0659 | PBSO1 | 225 | -2.14 | -4.02 |
| PBSO4 | 257 | -2.3129 | -5.1789 | PBSO1 | 233 | -2.38 | -4.43 |
| PBSO4 | 261 | -2.1157 | -4.9111 | PBSO1 | 237 | -2.59 | -4.84 |
| PBSO4 | 265 | -2.2534 | -4.8133 | PBSO1 | 241 | -2.27 | -5.13 |
| PBS04 | 269 | -2.1591 | -4.715 | PBSO1 | 245 | -2.31 | -5.08 |
| PBS04 | 273 | -2.3383 | -4.4296 | PBSO1 | 249 | -2.37 | -4.89 |
| PBS04 | 277 | -2.4603 | -4.0946 | PBS01 | 253 | -2.21 | -4.88 |
| PBSO4 | 281 | -2.9605 | -4.5945 | PBSO1 | 257 | -2.10 | -4.81 |
| PBSO4 | 285 | -2.9433 | -4.8197 | PBSO1 | 261 | -2.37 | -4.79 |
| PBSO4 | 289 | -2.8017 | -4.9358 | PBSO1 | 265 | -2.29 | -4.68 |
| PBS04 | 293 | -2.6044 | -5.4558 | PBSO1 | 269 | -2.24 | -4.63 |
| PBSO4 | 297 | -2.2442 | -5.7086 | PBS01 | 273 | -2.79 | -4.15 |
| PBSO4 | 301 | -3.4192 | -5.5438 | PBS01 | 277 | -2.76 | -4.35 |
| PBSO4 | 305 | -3.5904 | -5.009 | PBS01 | 281 | -2.45 | -4.43 |
| PBSO4 | 309 | -2.0904 | -4.7442 | PBS01 | 285 | -2.95 | -4.60 |

## 1. Shaded Corals

| coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|
| PBS04 | 313 | -1.3791 | -4.131 |
| PBS04 | 317 | -1.8461 | -4.0378 |
| PBS04 | 321 | -2.6022 | -4.4947 |
| PBSO4 | 325 | -2.9931 | -5.0201 |
| PBSO4 | 329 | -3.283 | -5.2869 |
| PBSO4 | 333 | -3.0427 | -5.1786 |
| PBSO4 | 338 | -2.653 | -5.2047 |
| PBSO4 | 342 | -2.2112 | -5.2495 |
| PBSO4 | 345 | -2.0479 | -5.154 |
| PBSO4 | 349 | -1.6276 | -4.9665 |
| PBSO4 | 353 | -2.0811 | -4.8805 |
| PBSO4 | 357 | -2.328 | -4.8323 |
| PBSO4 | 361 | -2.1438 | -4.0941 |
| PBSO4 | 365 | -2.8734 | -4.2361 |
| PBS04 | 369 | -2.9589 | -4.6919 |
| PBS04 | 373 | -3.1208 | -4.8474 |
| PBS04 | 377 | -3.0258 | -5.1225 |
| PBSO4 | 381 | -3.0613 | -5.1965 |
| PBSO4 | 385 | -3.0059 | -5.1771 |
| PBSO4 | 389 | -2.6355 | -5.1898 |
| PBSO4 | 393 | -2.4406 | -5.3624 |
| PBSO4 | 397 | -2.2218 | -5.3761 |
| PBSO4 | 401 | -2.3115 | -5.2231 |
| PBSO4 | 405 | -2.0514 | -4.9675 |
| PBSO4 | 409 | -1.677 | -4.4064 |
| PBSO4 | 413 | -2.3604 | -4.0227 |
| PBS04 | 417 | -2.4555 | -4.2763 |
| PBS04 | 421 | -2.3949 | -4.6673 |
| PBSO4 | 425 | -2.4431 | -4.7804 |
| PBS04 | 430 | -2.4948 | -5.2268 |
| PBS04 | 433 | -2.5803 | -5.0366 |
| PBS04 | 437 | -2.8762 | -5.0861 |
| PBS04 | 441 | -2.8648 | -5.1807 |
| PBS04 | 445 | -2.4777 | -5.1577 |
| PBS04 | 449 | -1.9486 | -5.093 |

| coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|
| PBS01 | 289 | -2.90 | -4.74 |
| PBS01 | 293 | -3.00 | -4.74 |
| PBS01 | 297 | -2.58 | -4.91 |
| PBS01 | 301 | -2.03 | -5.07 |
| PBS01 | 305 | -2.58 | -5.22 |
| PBS01 | 321 | -1.99 | -4.80 |
| PBS01 | 321 | -1.99 | -4.80 |
| PBSO1 | 325 | -1.91 | -4.59 |
| PBSO1 | 329 | -2.38 | -4.04 |
| PBSO1 | 329 | -2.46 | -4.33 |
| PBSO1 | 329 | -2.38 | -4.04 |
| PBSO1 | 333 | -2.71 | -4.33 |
| PBSO1 | 337 | -2.88 | -4.59 |

## 2. Control (=UNshaded) Coral

| coral | sample id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|
| PBO1- | 1 | -3.0177 | -5.4194 |
| PBO1- | 5 | -3.1321 | -5.2856 |
| PBO1- | 9 | -2.617 | -5.3311 |
| PBO1- | 13 | -2.4171 | -5.0117 |
| PB01- | 15 | -2.3835 | -4.4616 |
| PBO1- | 17 | -2.2219 | -4.1352 |
| PB01- | 19 | -1.8 | -3.8673 |
| PBO1- | 21 | -1.9278 | -3.7357 |
| PB01- | 23 | -2.4584 | -4.2197 |
| PBO1- | 25 | -2.5869 | -4.6444 |
| PB01- | 27 | -2.8406 | -5.036 |
| PBO1- | 29 | -2.6705 | -5.1682 |
| PB01- | 31 | -2.6665 | -5.1529 |
| PB01- | 35 | -2.4314 | -4.8403 |
| PB01- | 37 | -2.6059 | -4.9988 |
| PB01- | 39 | -2.3076 | -4.3228 |
| PB01- | 41 | -1.2415 | -4.0287 |
| PB01- | 43 | -0.9597 | -3.4027 |
| PB01- | 47 | -2.4126 | -4.3356 |
| PB01- | 49 | -2.6027 | -5.0167 |
| PB01- | 51 | -2.6087 | -4.9234 |
| PB01- | 53 | -2.7984 | -5.1618 |
| PB01- | 55 | -2.3706 | -5.2692 |
| PB01- | 59 | -2.3055 | -4.9886 |
| PB01- | 61 | -2.414 | -5.105 |
| PB01- | 63 | -2.445 | -4.9629 |
| PB01- | 65 | -2.4351 | -4.8919 |
| PB01- | 67 | -1.9862 | -4.5341 |
| PB01- | 69 | -2.2203 | -3.9246 |
| PB01- | 71 | -2.2193 | -3.9793 |
| PBO1- | 73 | -2.1362 | -4.2491 |
| PB01- | 75 | -2.3134 | -4.6569 |
| PBO1- | 77 | -2.8651 | -4.7891 |
| PB01- | 78 | -3.3419 | -4.9813 |
| PB01- | 83 | -3.0782 | -5.2278 |
| PBO1- | 85 | -3.0722 | -5.2357 |
| PB01- | 87 | -3.1386 | -5.1633 |
| PB01- | 91 | -2.8216 | -5.0645 |
| PB01- | 93 | -2.7508 | -5.1806 |
| PB01- | 95 | -2.6536 | -4.9666 |
| PB01- | 97 | -2.5894 | -4.879 |
| PB01- | 99 | -1.771 | -4.203 |
| PB01- | 101 | -1.216 | -3.8472 |
| PB01- | 103 | -2.357 | -4.3056 |
| PB01- | 105 | -2.1805 | -4.5004 |
| PB01- | 107 | -2.9922 | -5.0599 |
| PB01- | 109 | -2.9256 | -5.3146 |
| PB01- | 113 | -1.9195 | -5.1172 |

## 2. Control (=UNshaded) Coral

| coral | sampie id | $\delta^{13}C$ | $\delta^{18}O$ |
|---|---|---|---|
| PB01- | 115 | -2.0714 | -5.0309 |
| PB01- | 117 | -2.4589 | -5.1334 |
| PB01- | 121 | -2.741 | -5.0514 |
| PB01- | 123 | -2.5607 | -4.7237 |
| PB01- | 127 | -2.5136 | -4.5587 |
| PB01- | 129 | -2.4568 | -4.5234 |
| PB01- | 131 | -2.3737 | -4.2583 |
| PB01- | 133 | -2.612 | -4.4948 |
| PB01- | 135 | -2.8042 | -4.543 |
| PB01- | 137 | -2.8299 | -4.9312 |
| PB01- | 139 | -2.5983 | -5.0614 |
| PB01- | 141 | -2.6646 | -5.2069 |
| PB01- | 143 | -2.4994 | -5.1109 |
| PB01- | 145 | -2.7099 | -5.3233 |
| PB01- | 147 | -2.5713 | -5.3214 |
| PB01- | 149 | -2.2183 | -5.2231 |
| PB01- | 151 | -2.1457 | -5.2369 |
| PB01- | 153 | -2.4265 | -5.1706 |
| PB01- | 155 | -2.6718 | -5.1033 |
| PB01- | 157 | -2.6095 | -4.9876 |
| PB01- | 159 | -2.6642 | -4.9028 |
| PB01- | 161 | -2.3649 | -4.6441 |
| PB01- | 161 | -2.3667 | -4.7517 |
| PB01- | 165 | -2.8019 | -4.2429 |
| PB01- | 165 | -2.3793 | -4.0541 |
| PB01- | 169 | -2.5924 | -4.306 |
| PB01- | 169 | -2.5997 | -4.4212 |
| PB01- | 173 | -3.1773 | -4.824 |
| PB01- | 177 | -2.8752 | -5.2415 |
| PB01- | 181 | -2.1359 | -5.2113 |
| PB01- | 185 | -2.2101 | -5.0054 |
| PB01- | 189 | -2.6338 | -4.956 |
| PB01- | 193 | -2.7257 | -4.8881 |
| PB01- | 197 | -2.1318 | -4.1801 |
| PB01- | 201 | -2.5191 | -4.0283 |
| PB01- | 205 | -2.9401 | -4.5385 |
| PB01- | 213 | -2.8921 | -5.2638 |
| PB01- | 217 | -2.3851 | -4.9548 |
| PB01- | 221 | -2.4784 | -5.0018 |
| PB01- | 225 | -2.6909 | -4.8676 |
| PB01- | 229 | -2.4539 | -4.615 |
| PB01- | 233 | -2.3018 | -3.9713 |
| PB01- | 237 | -2.677 | -4.2994 |
| PB01- | 241 | -2.9718 | -4.7344 |
| PB01- | 245 | -2.7357 | -5.1461 |
| PB01- | 305 | -2.2498 | -5.0999 |
| PB01- | 313 | -2.0734 | -4.7052 |

*Appendix 6 Raw Data - Lipid and Tissue thickness values for the colonies undergoing natural bleaching (described in Chapter 3)*

| | March 98 | | April98 | | Aug99 | | Oct99 | | April00 | |
|---|---|---|---|---|---|---|---|---|---|---|
| colony | tissue thickness | lipid per cm3 | tissue thickness | lipid per cm3 | tissue thickness | lipid per cm3 | tissue thickness | lipid per cm3 | tissue thickness | lipid per cm3 |
| PB01 | 3.333333333 | 5.97465415 | 2.966666667 | 5.9277255 | 3.6 | 9.331175836 | 3.816666667 | 21.69755865 | | |
| PB02 | 2.5 | 11.6070288 | 2.106333333 | 6.935346 | 2.933333333 | 9.172337474 | 3.1 | 10.3229808 | 3.1 | 6.872094214 |
| PB03 | 2.9 | 7.34777124 | 2.432666667 | 7.0898573 | 2.733333333 | 8.37697274 | 2.466666667 | 8.671102921 | 2.8 | 7.335381464 |
| PB04 | 2.466666667 | 7.89983665 | 2.165666667 | 12.863366 | 2.566666667 | 21.65112504 | | | | |
| PB05 | 2.966666667 | 5.62497428 | 2.7145 | 7.0335454 | 2.866666667 | 25.5654382 | 4.116666667 | 21.97552705 | 3.366666667 | 7.732086641 |
| PB06 | 2.7 | 3.98269847 | 2.833166667 | 5.5180844 | 4.4 | 9.889118457 | 4.566666667 | 16.7222001 | 3.45 | 8.856303874 |
| PB07 | 4.15 | 2.80131805 | 3.574833333 | 2.5006947 | 4.133333333 | 13.38653361 | 4.75 | 11.51774583 | 3.425 | 8.417884729 |
| PB08 | 3.483333333 | 1.98571042 | 2.951833333 | 2.4209643 | 3.2 | 7.890202703 | 4.2 | 11.39977195 | | |
| PB09 | 3.25 | 4.73410903 | 2.922166667 | 1.4829179 | 4.433333333 | 4.677837642 | 3.45 | 9.516173584 | 2.875 | 5.875498096 |
| PB10 | 4.183333333 | | 3.500666667 | 11.769451 | 4.066666667 | 12.91685575 | 3.666666667 | 18.52539701 | 3.375 | 10.08060744 |
| | | | | | | | | | | |
| PBS01 | 3.216666667 | 9.25255043 | 2.996333333 | 7.151598 | 2.966666667 | 3.944811633 | 4.133333333 | 14.15616865 | 3.325 | 8.463071554 |
| PBS02 | 2.966666667 | 3.4343276 | 2.581 | 4.6410731 | 3.133333333 | 22.01190764 | 3.433333333 | 11.38727077 | 2.775 | 8.202500021 |
| PBS03 | 2.45 | 15.0696864 | 2.076666667 | 11.767233 | 2.5 | | 2.866666667 | 13.45167902 | 3.175 | 7.2952924 |
| PBS04 | 2.9 | 7.5910134 | 2.432666667 | 6.7834617 | 3.2 | 10.53244651 | 2.983333333 | 18.34628837 | 3.575 | 6.984470556 |
| PBS05 | 3.75 | 8.77658537 | 3.233666667 | 9.0511162 | 3.2 | | 3.383333333 | 22.93304995 | | |
| PBS06 | 2.783333333 | 19.9015848 | 2.462333333 | 7.8300224 | 3.5 | 13.34932221 | 3.583333333 | 23.05352529 | 3.6 | 10.94909937 |

Tissue thickness represents the average of three measurements for each of two replicate samples. Lipid concentration likewise represents the average of two samples. Lipid concentration measurements (described in Chapter 3) represent the weight in grams of lipids from a piece of coral of known surface area divided by the thickness of the tissue layer from which it was extracted.