GUAM'S REEFS AND BEACHES
PART II
SEDIMENTATION STUDIES AT FOUHA BAY AND YLIG BAY

Richard H. Randall and Charles Birkeland

COASTAL ZONE
INFORMATION CENTER

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Cover photograph: Suspended sediment load tubes in site at a station in Fouha Bay.

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By

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Introduction

Background and Objectives

Sediments on Guam's fringing reefs can be grouped into two broad categories. The first category of sediments is composed predominantly of organic carbonates derived from the skeletal remains of reef organisms and are thus called bioclastics. Such sediments are continuously produced with their composition and distribution being dependent upon the activities of grazing fishes, urchins, burrowing sponges, sipunculans, bivalves, and on factors such as community structure, wave exposure, current patterns, and reef morphology. The second category of sediments is composed mostly of detrital materials derived from the physical and chemical decomposition of the volcanic rocks of southern Guam. These materials consist of clay, silt, sand, rubble, organic detritus, and various kinds of dissolved materials.

Although reef communities are certainly affected by bioclastic sediments generated within the reef system, the organisms associated with reefs are generally adapted to such continuous long-term patterns of production and distribution. Sedimentation from terrestrial sources, though, is not so uniform in distribution and time. It is usually concentrated at river mouths and it comes in the form of pulses associated with periods of heavy rainfall resulting in high stream discharge rates. During periods of low rainfall, discharge is low and the water is relatively clear. Reef morphology and community structure are thereby naturally altered and adjusted to these rather unpredictable pulses of sedimentation near river and stream mouths which depend upon the size and nature of the drainage basin.

One of the principal effects on the marine environment from urbanization, agricultural and industrial development, and dredging and filling in of coastal areas is the impact of increased rates of sedimentation on the nearby reef systems. The effect of such activities on these reef systems range from negligible to catastrophic. It is well documented (Van Eepoel and Grigg, 1970; Maragos, 1972) that sedimentation has an adverse effect on planula settlement, coral growth, and reef development. Many other organisms associated with reefs are also badly affected. The development of fringing reefs is conspicuously altered, reduced, or absent in coastal river embayments where sedimentation rates are high. A gradient of decreased coral diversity is found from the mouths to the heads of these embayments. Such embayment areas can be used as natural laboratories to study the effects of terrestrial sediments on fringing reef systems.

Studies were conducted at two different river embayment locations to relate community structure to natural suspended sedimentation rates (Fig. 1). Ylig River and La Sa Fua River were selected as study sites

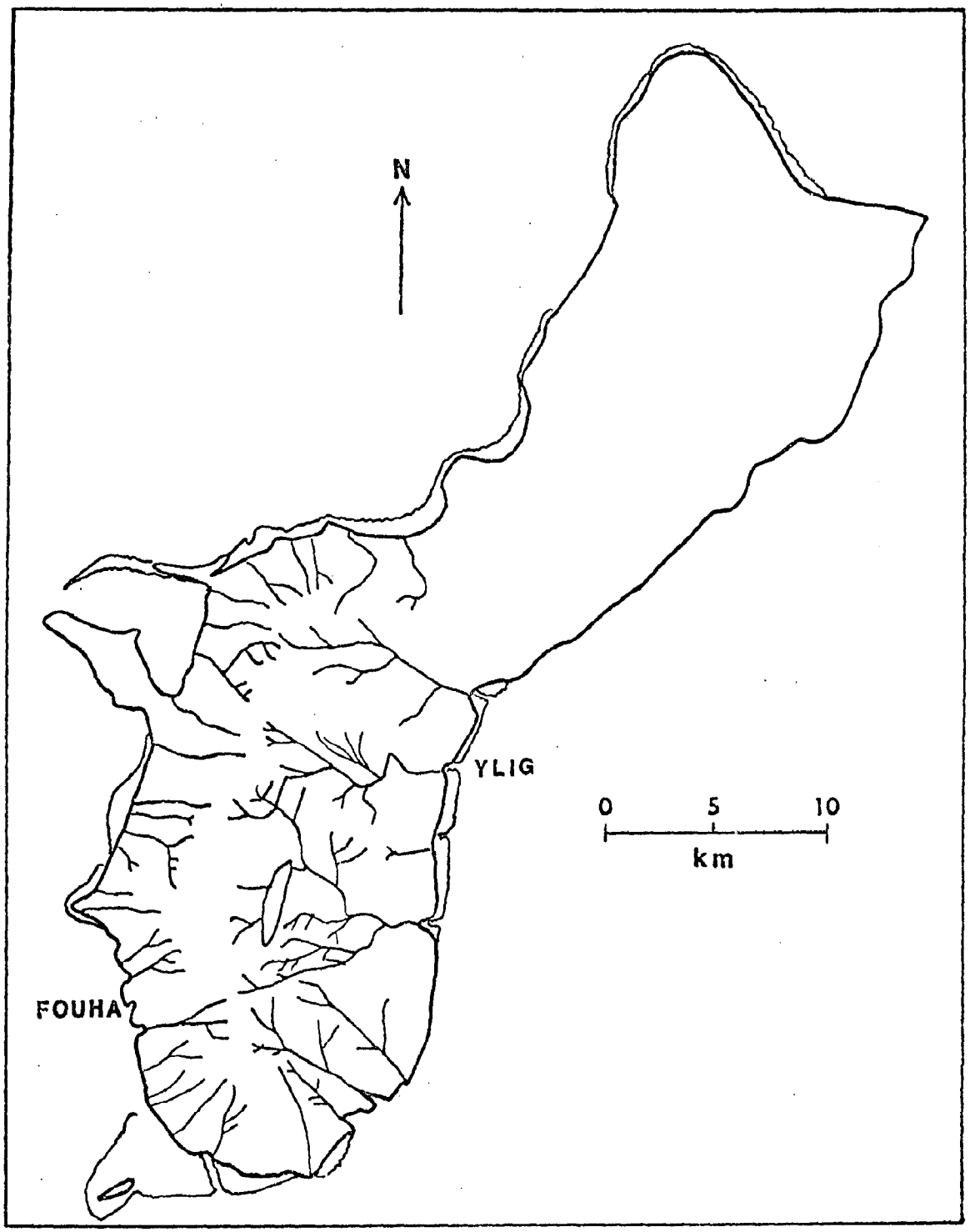

Fig. 1 . Map of Guam showing the study sites at Fouha and Ylig Bays.

because a gradient of sedimentation rates were found where corals and most associated reef organisms are completely absent at the heads of the embayments, and become a diverse and well developed reef community at the mouths of the embayments.

The study was approached by measuring suspended sedimentation rates, total solids, pH, salinity, temperature and, nutrient contents (phosphates and nitrates) in the water at eight stations along the gradient from the river mouths to the reef margins at La Sa Fua River (Fig. 2) and Ylig River (Fig. 3). These six factors will be analyzed for correlation with the biological components of the coral reef community.

By comparing the natural gradients of suspended sedimentation rates and community structure from the mouth to the head of these embayments, a cause and effect relationship can be determined. These values can be programmed with data from other reef environments to predict sedimentation impact due to increased input from land and coastal developments. These data will also be valuable in establishing performance standards for allowable sedimentation rates in reef environments.

General Description of the Bays

Although the geographic place names for the Fouha and Ylig study sites are refered to as bays (Figs. 2 and 3), the overall morphology of the two regions are more like submarine channels that penetrate through the fringing reefs from the outer margins to the river mouths at the shoreline. The sides of the submarine channels consist mostly of very steep slopes and cliff faces that are locally overhanging at many places along the upper part, and mostly steep slopes with fewer cliffs and overhanging walls along the lower part. The lower channel slopes at most places are buttressed with large boulders and blocks that have slumped downward from the upper channel walls. Some of the larger blocks are two or more meters across and give the lower channel areas much of their irregular relief. The channel floors composed for the most part of unconsolidated sediments of an undetermined thickness with a few mounds and pinnacles scattered along their length. In cross-section, at any one location, the channel floors are relatively flat, but along their length they slope gently downward from the river mouths in a seaward direction. Water depth in the channels range from 3 to 4 meters at the head to about 10 meters near the mouth at Fouha Bay and from 3 to 4 meters at the head to about 25 meters near the mouth at Ylig Bay. The principal physiographic features of the channel reefs and water depth are shown in vertical profile at each suspended sediment station at Fouha Bay in Figure 4, and at Ylig Bay in Figure 5.

Although the reef channel at Ylig Bay is considerably larger and somewhat deeper at the mouth than that at Fouha Bay, the principal differences between the two regions appear to be in the larger size of the drainage basin, and greater average, peak, and low flow discharge rates at the former. The drainage basin of the Ylig River is 6.58 sq. miles and based upon a 13 year period the average flow was 28.2 cfs, peak discharge

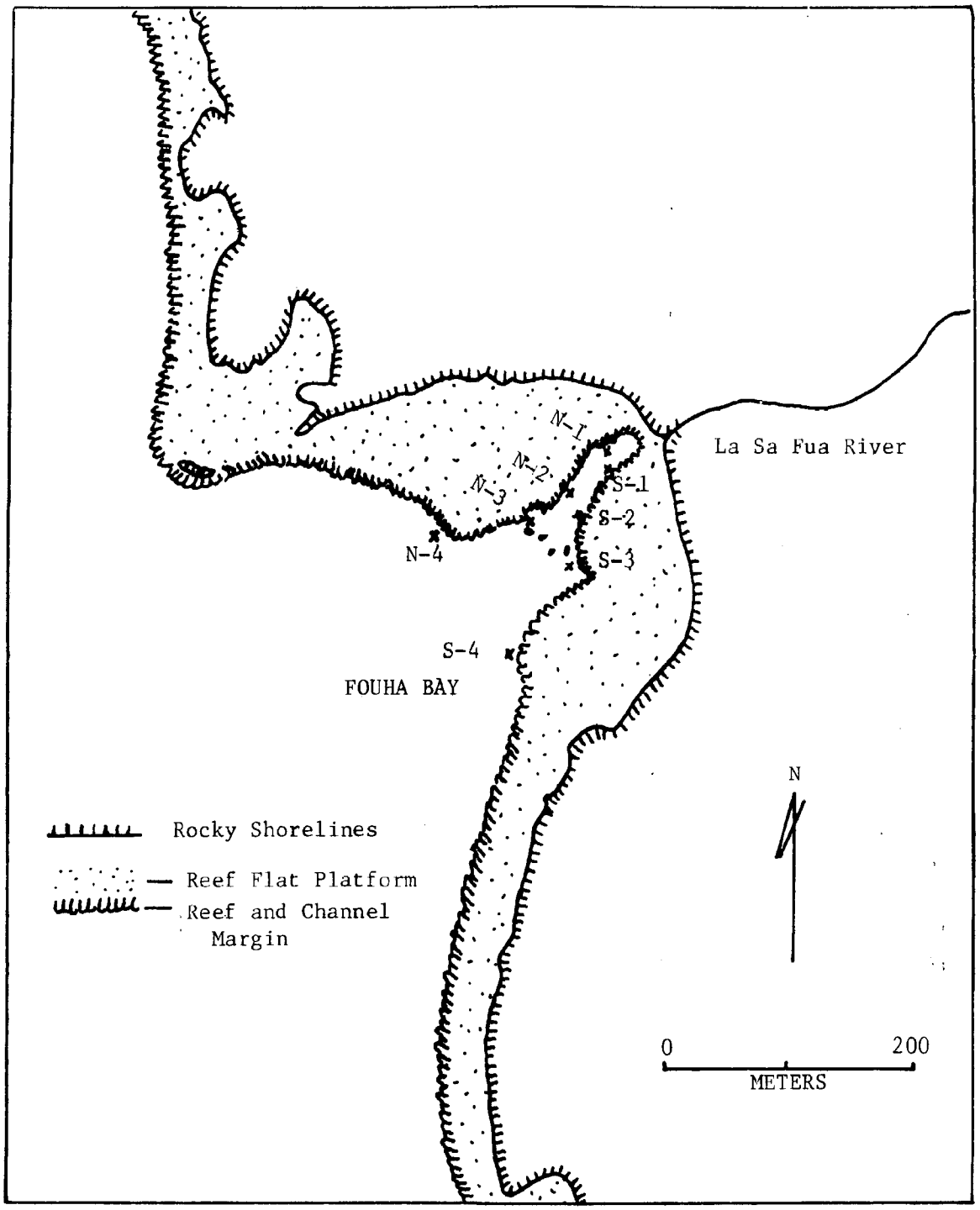

Fig. 2. Fouha Bay showing the locations of the sediment stations.

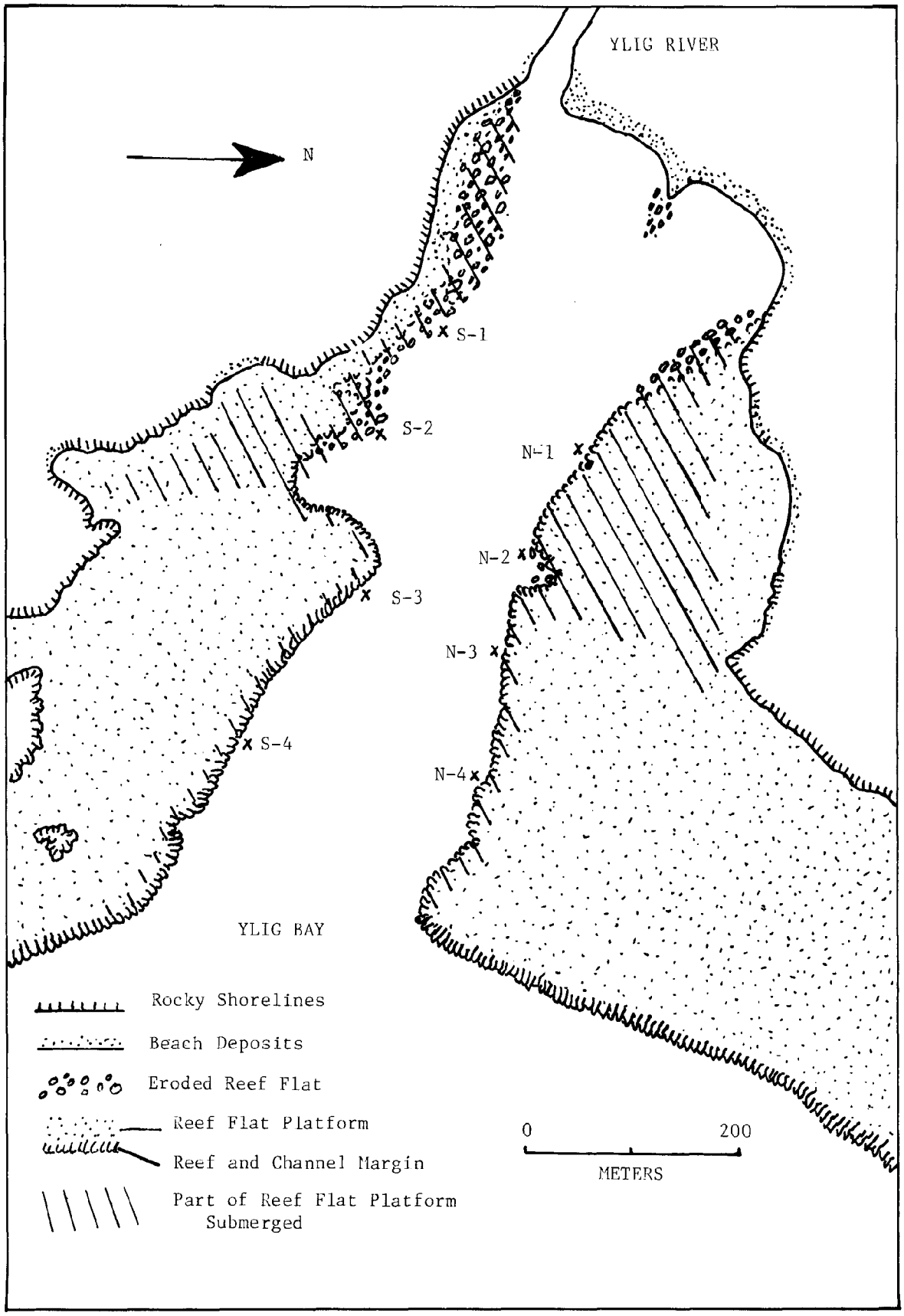

Fig. 3. Ylig Bay showing the location of the sediment stations.

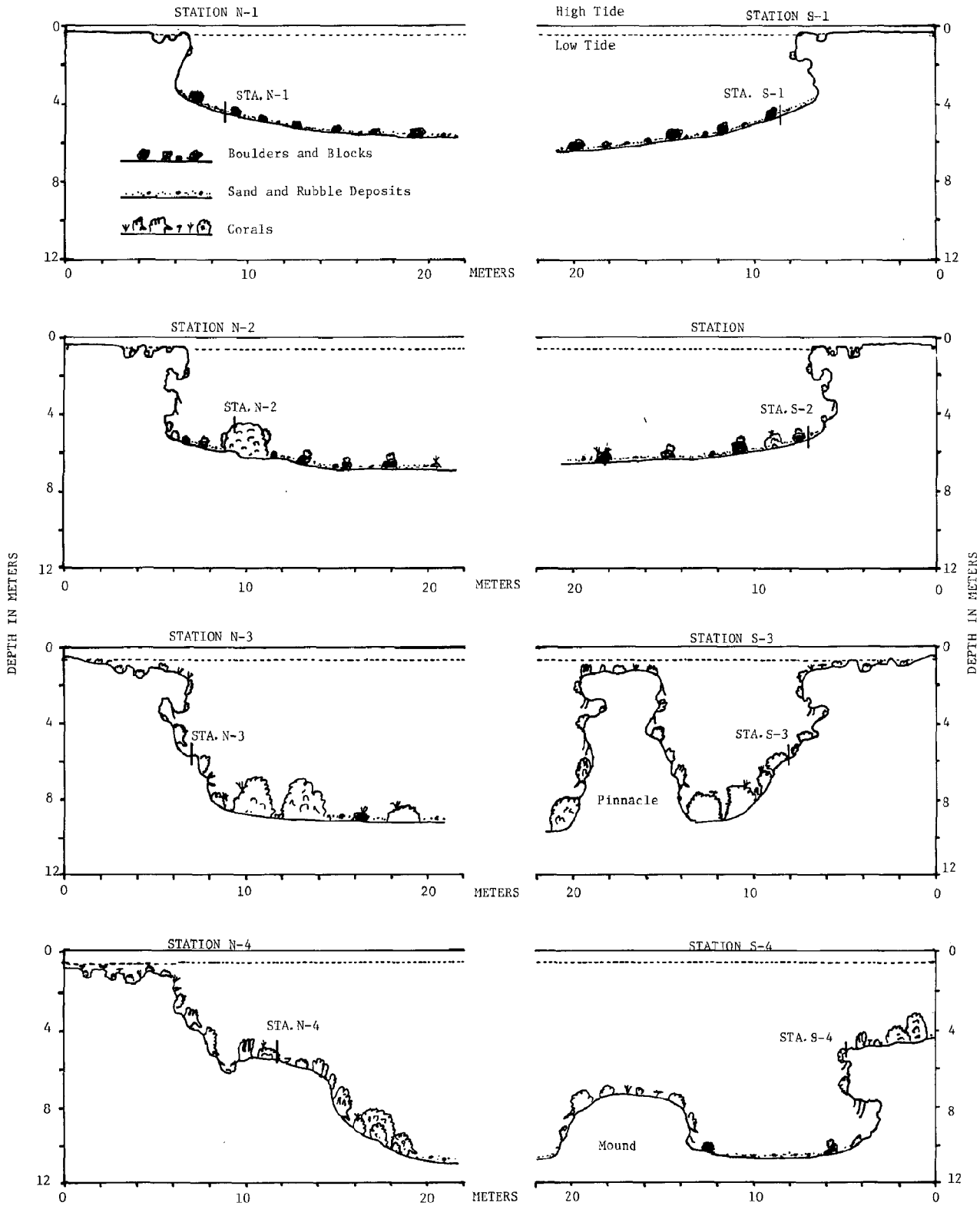

Fig. 4. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations at Fouha Bay. Vertical exaggeration is X 1.

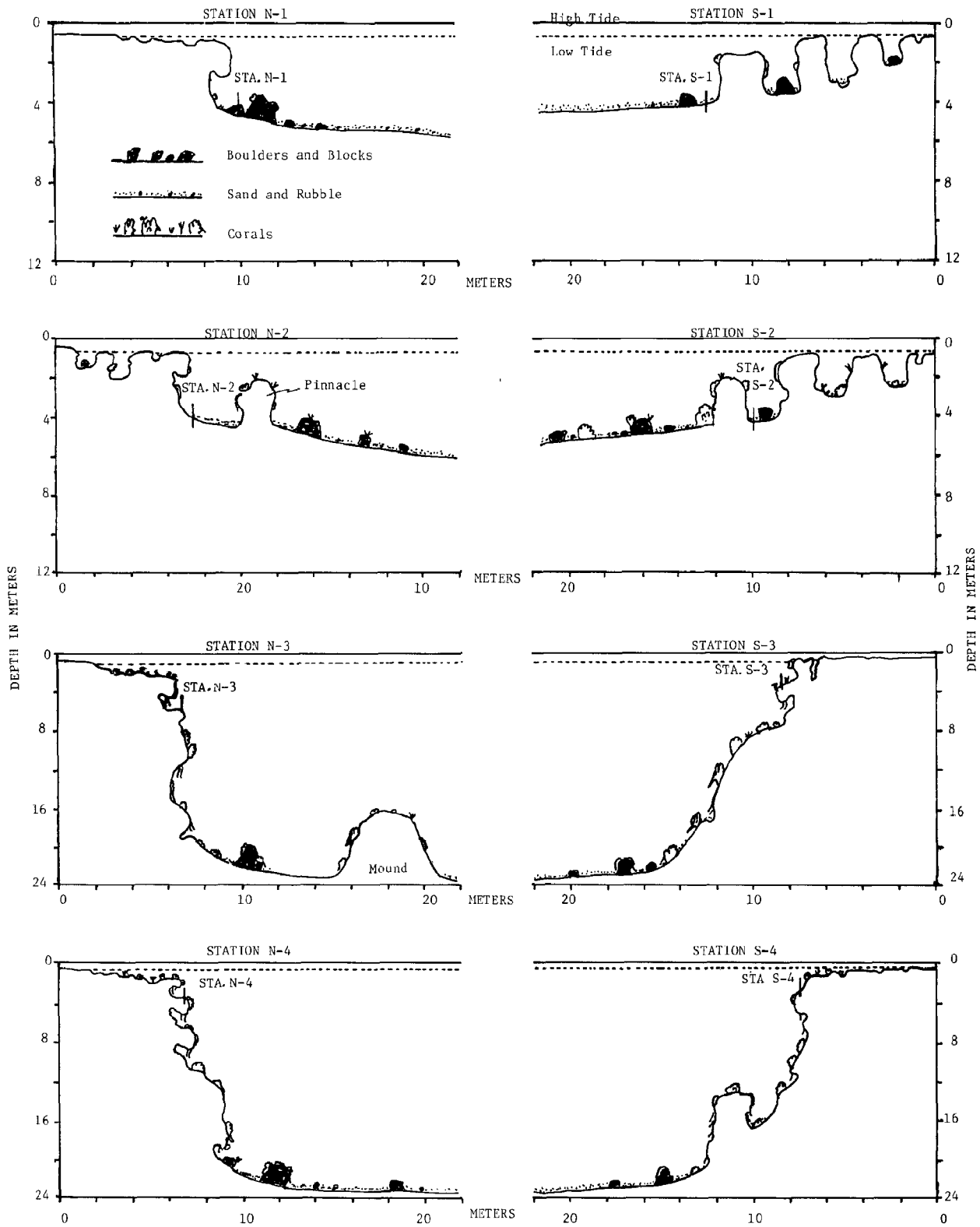

Fig. 5. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations of Ylig Bay. Vertical exaggeration is X 1 for Stations N-1, N-2, S-1, and S-2 and X 2 for Stations N-3, N-4, S-3, and S-4.

was 4900 cfs on September 9, 1963, and minimum discharge was .5 cfs on June 2, 1965. The drainage basin of the La Sa Fua River is 1.93 sq. miles and based upon a 5 year period the average flow was 4.43 cfs, peak discharge was 1050 cfs on October 15, 1953, and minimum discharge was .29 cfs on May 11, 1958. Discharge data are taken from the Geologic Survey Water Supply Paper 1937 (1971).

Zonation Patterns

Because of the variation in reef physiography, community structure of the corals, and depth of the channel floor where the sediment trap tubes were placed, the channel reef in the vicinity of each suspended sediment station was divided into four zones.

The uppermost zone is the channel margin which consists a narrow peripheral band or shallow terrace 2 to 10 meters wide along the upper edge of the channel that retains water during low spring tides. The topography of the channel margin is irregular because of scattered holes and small knobs and pinnacles on the surface.

The channel wall is divided into two zones consisting of an upper slope and lower slope. The upper slope extends downward from the upper edge of the channel wall to the depth of the sediment trap tubes (3.8 to 4.6 meters) and the lower slope extends down to the unconsolidated sediments of the channel floor. The boundary between the upper and lower slopes is not a natural physiographic division, but was arbitrarily established to divided the channel wall into two coral communities--one above the sediment tube traps and one below them.

The fourth and lowermost zone is the channel floor which for the most part consists of a mixture of bioclastic sediments of reef origin and volcanic detrital sediments of terrestrial origin. A few boulders, blocks, and rocky mounds and pinnacles protude upward through the sediments here and there.

Methods

Physical and Chemical Characteristics of the Water

The physical and chemical characteristics of the water were sampled on four dates at three-month intervals in 1977, at ten stations in Fouha Bay and at eight stations in Ylig Bay. The sampling sites were each within a few decimeters of the apertures of the sediment trap tubes of each of the stations.

Water temperature was measured with a protected field thermometer which was taken underwater and laid near the sediment trap tubes for at least two minutes to allow the thermometer to equilibrate.

Water was sampled for chemical analysis by opening and closing the polyethylene sampling bottles underwater at the sampling stations. The bottles were then placed in an ice chest and transported to the freezer in the Water Resources Research Center (WRRC) laboratory room at the Marine Laboratory. The samples were analyzed for NO_3-N, NO_2-N and PO_4-P by the WRRC staff according to the methods of Strickland and Parsons (1968).

Salinity and pH were measured in samples brought to the surface in a plastic freezer jar. An American Optical Corporation refractometer was used to measure salinity. A Corning Model 610A portable pH meter was used to measure pH.

Measurement of Suspended Sediment Load

The suspended sediment load in the water column was measured at ten selected stations in Fouha Bay and at eight stations in Ylig Bay. Half of the stations were located along the north side of each bay and the other half of the stations were located at comparable locations along the south side of each bay. The first pair of stations (one on the north side of the bay, the other on the south side) was located where the first living coral colony was found as we swam seaward from the mouth of the river that emptied into the bay. The second pair of stations was found where living corals first became prevalent. The third pair of stations was located where the first living colony of *Acropora* was found and the fourth pair of stations was located where we judged the reef to be well developed and rich in species. A fifth pair of stations was established at Fouha Bay where the extent of coral cover and species richness have declined markedly as we moved seaward of the fourth stations. Stations were all established at depths of 3.8 to 4.6 m.

Suspended sediment load trap tubes consisted of PVC pipe (41 cm in length) that were strapped in groups of four (for replicate samples) to rebar rods. The rebar rods were hammered into the reef at the sampling stations to mark the location of the station and to keep the sediment tubes standing upright (see cover photograph). The apertures of half of the tubes

were bevelled and the aperatures of the other half of the tubes were left truncated (Fig. 6) to test for the differences in sampling results from these two sets of tubes. No significant differences in results were found, so the data from these two sets of tubes were pooled.

The aperture diameters of the tubes made from the PVC pipes ranged between 22.75 and 24.25 mm (23.7 $\pm$ 0.44 mm), therefore the areas of the apertures ranged from 4.06 to 4.62 cm^2 ($\bar{Y}$ = 4.4 cm^2).

The tubes were left out for 6 weeks if possible. On one occasion, hazardous surf conditions prevented us from collecting the tubes on schedule. The data from delayed collection were each corrected for comparison with data from six-week exposures as explained in the tables in which the data were given.

Rubber stoppers were placed in the apertures of the tubes before the tubes were collected and brought to the laboratory. At the Marine Laboratory, the sediment was rinsed from the tubes into clean beakers that had been previously weighed and labeled. Distilled water was poured into the beaker. The sediment was then allowed to settle for 24 hours. The water was then decanted and this rinsing procedure was continued for four days (four rinsings, each once a day) to get rid of the salts from the seawater. Then, after the fifth decanting, the beakers with the sediment were placed in the drying oven for four days at 80°C. On the fifth day, the beakers were placed in a desiccator and allowed to reach room temperature beside the microbalance overnight. The beaker with dried sediment was then weighed and the weight of the empty beaker was substracted.

Corals

The community structure of the corals was assessed at four zones in the vicinity of each of the suspended sediment stations (N-1 through N-4 and S-1 through S-4) at Fouha and Ylig Bays. The parameters assessed at each station were species diversity, frequency of occurrence, density, percent of substrate coverage, and colony size distribution data ($\bar{Y}$ - average size, s-standard deviation, and w-size range). The fifth pair of stations at Fouha Bay were assessed only for percent of substrate coverage.

Frequency of occurrence, density, and percent of substrate coverage were calculated by using a point-quadrat method. The quadrat consists of a square frame, 35 cm on a side, that was divided into a grid of 49 intersecting points by small plastic lines spaced 5 cm apart. The quadrat was randomly tossed at each of the four channel reef zones within an area that extended ten meters to the left and right of each sediment trap station.

Frequency of occurrence of a species within a zone was determined by totaling the number of quadrats that the species was present and dividing it by the total number of tosses. Percent of substrate coverage for each species within a zone was calculated by totaling the number of quadrat points overlying the species for all the quadrat tosses and dividing it by the total number of possible points (49 x number of tosses) X 100. Density of a species within a zone was determined by totaling the number of occurrences of the species within the quadrat for all the quadrat tosses

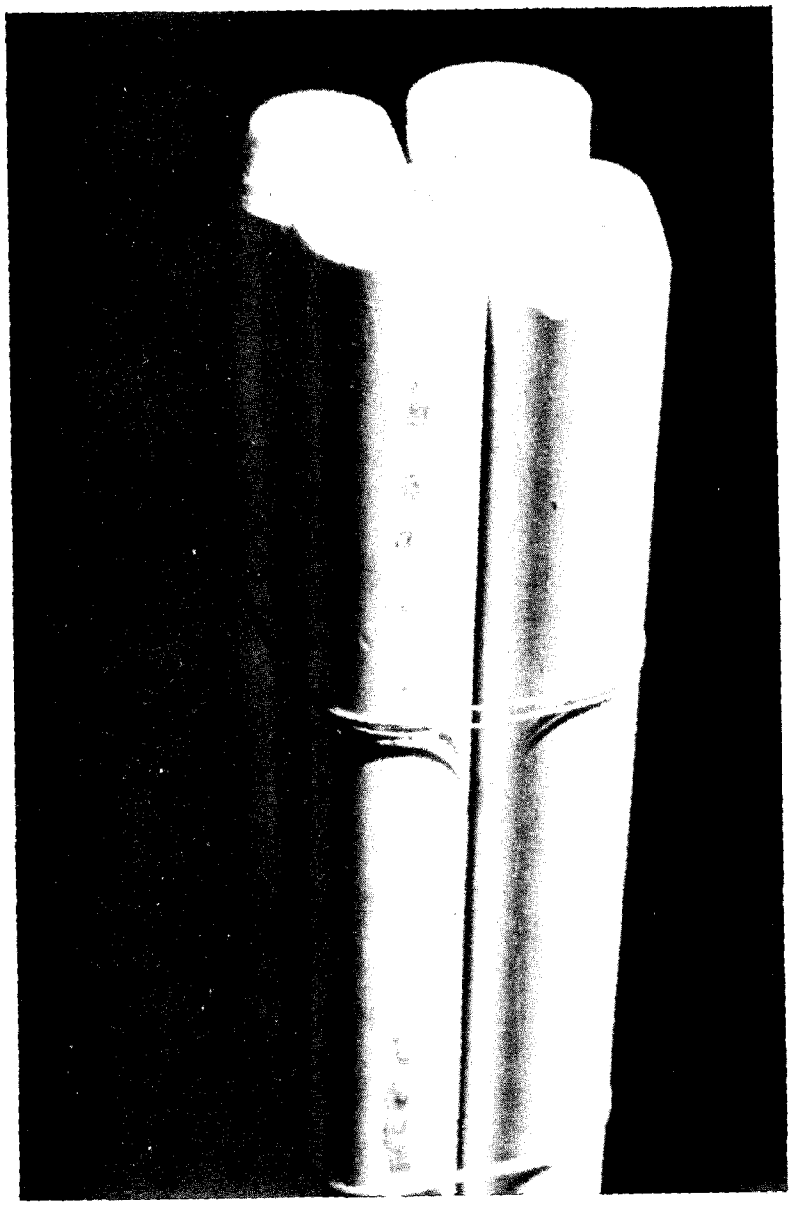

Fig. 6. Bevelled and truncated apertures on a set of suspended sediment load trap tubes.

and dividing it by the total area of all the tosses. A coral was considered to be within the confines of the quadrat if more than half of its area was inside the quadrat frame. Colony size distribution data for each species within a zone was calculated by recording the name and diameter, or greatest length and width, of all the colonies that occurred withing each quadrat toss. In order to acquire a greater number a data for size distribution calculations, the name and size of the coral nearest each of the outside corners of the quadrat frame were also recorded for each toss. Only colonies within a distance of one meter from the quadrat corners were measured.

Species diversity was acquired by listing all the species that were encountered during the point-quadrat sampling for frequency, density, percent of substrate coverage, and size distribution data. Additional species were also recorded from observations made during the study period by snorkeling and scuba diving in the general area of each sediment trap station.

Results

Temperature, pH and salinity

The physical characteristics of the water (temperature, pH and salinity) varied significantly from day to day in both Fouha Bay and Ylig Bay (Tables 1-6). There were no significant differences between stations with either pH or salinity, partly because they both varied greatly between dates across all stations (Tables 3-6). For example, all stations in the bays might have lower salinities after a heavy rain. No stations in these bays appeared to vary in a significantly different manner from other stations in either pH or salinity.

In Fouha Bay, a relatively small bay, there were no significant differences in water temperatures between stations (Table 1). This was partly because they all varied together between dates. In Ylig Bay, a larger bay, there was a very slight tendency for Station S-2 to have higher temperatures than the other stations. This was probably because Station S-2 was farther back into a shallow embayment off the main river channel than were the other stations. Partly because of this, there was a difference (just barely significant) between stations for water temperature in Ylig Bay (Table 2).

Temperature, pH and salinity were found to be of no value in our study as environmental factors to correlate with characteristics of the reef community. These environmental factors are of importance in influencing the characteristics of reef communities on a larger scale, but within the scale of our study areas these factors all varied significantly with time. There were no very significant differences between stations, therefore we cannot correlate reef characteristics with these environmental factors within these bays.

Nitrates and phosphates

As with temperature, pH and salinity, the nitrate and phosphate levels in the water generally varied so greatly between sample dates that it was very difficult to demonstrate differences between stations. Phosphate levels varied significantly between dates in both Fouha Bay and Ylig Bay and nitrate levels varied significantly between dates in Fouha Bay (Tables 7-9).

The variation from measurement error or differences in nitrate and phosphate levels was very great between water samples taken only moments apart. Variations between replicate samples at each station were so great that no significant differences could be found between stations on a given day in terms of phosphate levels in the water along the north side of bays versus the south sides in either bays (Fouha or Ylig), between

Table 1. Temperature (°C) of the water near the mouth of the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	27.9	29.0	30.2	28.2
S - 2	28.0	28.9	29.8	28.2
S - 3	28.2	28.8	29.2	28.2
S - 4	28.0	28.9	30.5	28.3
S - 5				28.3
N - 1	28.0	29.0	30.1	28.2
N - 2	27.9	28.9	30.1	28.2
N - 3	28.4	28.9	30.4	28.2
N - 4	28.0	29.0	29.8	28.2
N - 5				28.3

Source of variation	df	MS	Fs
Dates	3	6.38	128 ***
Stations	7	.055	1.10 ns
Error	21	.0499	

Table 2. Temperature (°C) of the water near the mouth of the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	28.1	30.5	28.7	28.5
S - 2	28.1	30.3	30.2	29.0
S - 3	27.3	29.6	29.65	28.0
S - 4	27.2	29.8	29.45	27.9
N - 1	27.6	29.6	29.6	28.0
N - 2	27.7	29.8	29.8	28.5
N - 3	27.5	30.2	29.7	27.8
N - 4	27.4	29.6	29.75	27.85

Source of variation	df	MS	Fs
Dates	3	9.84	92.3***
Stations	7	.286	2.68*
Error	21	.1066	

Table 3. Water pH near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	8.0	8.0	7.7	8.4
S - 2	8.0	8.0	7.7	8.4
S - 3	8.1	8.0	7.6	8.2
S - 4	8.05	7.9	7.8	8.2
S - 5				8.25
N - 1	8.1	8.0	7.7	8.1
N - 2	7.95	7.9	7.8	8.1
N - 3	7.95	7.9	7.8	8.3
N - 4	8.05	7.9	7.7	8.15
N - 5				8.15

Source of variation	df	MS	Fs
Dates	3	.3502	48.4***
Stations	7	.0044	.603 ns
Error	21	.0072	

Table 4. Water pH near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	8.1	7.55	7.8	8.2
S - 2	8.2	7.5	8.0	8.2
S - 3	8.1	7.45	8.1	7.7
S - 4	8.1	7.45	8.0	7.9
N - 1	8.1	7.6	7.9	8.0
N - 2	8.1	7.55	8.1	8.1
N - 3	8.1	7.50	8.1	7.8
N - 4	8.0	7.55	8.1	7.8

Source of variation	df	MS	Fs
Dates	3	.54	36.3***
Stations	7	.01	.67 ns
Error	21	.0149	

Table 5. Water salinity (°/oo) near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	34	35	33.3	36
S - 2	36	38	33.3	35
S - 3	36	35	33.3	35
S - 4	36	35	34.4	36
S - 5				36
N - 1	35.5	35	32.2	35
N - 2	33	35	32.8	34
N - 3	35.5	35	33.3	34
N - 4	35.5	35	34.4	35
N - 5				36

Source of variation	df	MS	Fs
Dates	3	6.76	9.8**
Stations	7	1.38	2.007 ns
Error	21	.690	

Table 6. Water salinity near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	34	34.3	31	33
S - 2	34.5	32	32	34
S - 3	34	36	31.8	34
S - 4	35	34	32	34
N - 1	34.5	34	31.5	33
N - 2	34	34	31.5	34
N - 3	35	34	31.5	34
N - 4	34	34	32	35

Source of Variation	df	MS	Fs
Dates	3	12.19	25.8***
Stations	7	.466	.99 ns
Error	21	.474	

Table 7 . Phosphate levels (μg-at/l) in the water near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	.11	.20	.22	.19
S - 2	.12	.18	.19	.18
S - 3	.13	.20	.16	.14
S - 4	.14	.16	.15	.14
S - 5				.19
N - 1	.12	.24	.18	.19
N - 2	.11	.14	.17	.18
N - 3	.13	.18	.20	.19
N - 4	.11	.15	.16	.17
N - 5				.15

Source of variation	df	MS	Fs
Dates	3	.00695	24.3***
Stations	7	.0009	3.12*
Error	21	.0003	

Table 8. Phosphate levels (μg-at/l) in the water near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates 30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	.19	.09	.09	.19
S - 2	.16	.08	.09	.13
S - 3	.18	.10	.10	.23
S - 4	.19	.10	.12	.20
N - 1	.19	.16	.19	.20
N - 2	.05	.10	.10	.12
N - 3	.23	.08	.11	.14
N - 4	.13	.07	.14	.13

Source of variation	df	MS	Fs
Dates	3	.0093	8.2*
Stations	7	.0033	2.9*
Error	21	.0011	

Table 9. Nitrate levels (µg-at/l) in the water near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

	Collection Dates			
STATIONS	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	.25	.95	.21	1.8
S - 2	.49	1.2	.28	.59
S - 3	.39	.80	.37	.22
S - 4	.42	.82	.41	.17
S - 5				.17
N - 1	.42	.41	.21	.14
N - 2	.35	2.0	.23	.32
N - 3	.74	1.2	.34	.47
N - 4	.28	.46	.28	.18
N - 5				.27

Source of variation	df	MS	Fs
Dates	3	.738	4.9*
Stations	7	.156	1.04 ns
Error	21	.1506	

Table 10. Nitrate levels (µg-at/l) in the water near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

Collection Dates

STATIONS	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	.62	1.3	2.6	.70
S - 2	.12	.32	1.3	1.4
S - 3	.21	4.3	.98	.40
S - 4	.28	.77	2.1	.73
N - 1	.18	.45	1.3	.63
N - 2	.16	.36	.65	.36
N - 3	.21	.59	.70	.55
N - 4	.18	.56	.89	.53

Source of variation	df	MS	Fs
Dates	3	1.77	2.99 ns
Stations	7	.6127	1.04 ns
Error	21	.5915	

stations along a river mouth to the seaward gradient in either of the bays, or in the interaction between the side of the bay and the position along the seaward gradient (Tables 11 and 12). Similarily, no significant differences in nitrate levels could be found between any of these arrays of stations in Fouha Bay (Table 13).

A part of the variation between replicate samples in this study was undoubtedly caused by problems with laboratory methods, but probably another part of the variation was caused by changes in tidal state, wave action, turbulence, time of day, currents and weather. These sources of variation along with variation between dates were so large that precise measurements from a moment in time were of little, if any, value to our studies of the characteristics of the reef community within the scale of the studies. For these measurements to be of value, they should be taken very frequently or, alternatively, with some integrative measurement such as that by which suspended sediment load was determined. If this could be done, the measurements of nitrates and phosphates might be of value.

There appears to be a general trend for a decrease in nitrate and phosphate contents of water between river mouth and seaward stations. However, this trend was very vague. Statistical tests were performed on the eight possible comparisons of near shore versus offshore stations for phosphate or nitrate levels in water from the north or south sides of Fouha Bay or Ylig Bay. Only one of these comparisons showed a significant difference. There was a significantly greater concentration ($t_{s[6]}=3.708$**) of phosphates at the nearshore Station N-1 (.18 ± .02 µg - at/l) than at the offshore Station N-4 (.12 ± .03 µg - at/l) in Ylig Bay. However, there was a lower concentration of phosphates at the nearshore Station S-1 than at the offshore Station S-4. Therefore, the general trend for a reduction in nutrients from nearshore to offshore stations was very weak if it existed at all. There was a significant difference between pairs of stations in Fouha Bay in terms of phosphate levels in the continuous gradient from nearshore to offshore stations (Table 7).

A paired comparison by a two-way anova with a randomized block design was made between comparable stations on north and south sides of each bay (Table 15). There were no differences in phosphate levels on the two sides in either bay. However, there was a significantly greater concentration of nitrates in the water along the south side of Ylig Bay than along the north side (Tables 14 and 15).

In summary, the variations between replicate samples and between dates were so great for the nitrate and phosphate data that it was difficult to determine any significant trends. There was a vague tendency for nitrates and phosphates to decrease along a nearshore to offshore gradient and there was a significantly greater concentration of nitrates along the south shore than along the north shore of Ylig Bay.

Table 11. Phosphate levels (µg-at/ℓ) in replicate samples in the water near the sediment traps at the ten stations in Fouha Bay on 15 XII 1977.

STATIONS	NORTH	SOUTH	Σ
1	.18	.17	.75
	.20	.20	
2	.18	.20	.71
	.17	.16	
3	.17	.14	.65
	.20	.14	
4	.15	.13	.61
	.18	.15	
5	.15	.20	.66
	.14	.17	
Σ	1.72	1.66	3.38

Source of Variation	df	MS	Fs
North versus South	1	.00019	.6 *ns*
Stations along a seaward gradient	4	.00078	2.5 *ns*
Interaction of stations and side of bay	4	.00108	3.4 *ns*
Error	10	.00031	

Table 12. Phosphate levels (µg-at/ℓ) in replicate samples in the water near the sediment traps at the eight stations in Ylig Bay on 1 II 1978.

STATIONS	NORTH	SOUTH	Σ
1	.13	.21	.79
	.28	.17	
2	.12	.11	.49
	.12	.14	
3	.14	.32	.73
	.14	.13	
4	.13	.23	.65
	.13	.16	
Σ	1.19	1.47	2.66

Source of Variation	df	MS	Fs
North versus South	1	.0055	1.34 *ns*
Stations along a seaward gradient	3	.0042	1.02 *ns*
Interaction of stations and side of bay	3	.0022	.54 *ns*
Error	8	.0041	

Table 13. Nitrate levels (µg-at/ℓ) in replicate samples in the water near the sediment traps at the ten stations in Fouha Bay on 8 II 1978.

STATION	NORTH	SOUTH	Σ
1	.14	.11	3.88
	3.47	.16	
2	.34	.20	1.81
	.84	.43	
3	.23	.45	1.36
	.20	.48	
4	.09	.14	.71
	.25	.23	
5	.04	.27	.88
	.30	.27	
Σ	5.9	2.74	8.64

Source of Variation	df	MS	Fs
North versus South	1	.497	.86 *ns*
Stations along a seaward gradient	4	.408	.71 *ns*
Interaction of stations and side of bay	4	.607	1.05 *ns*
Error	10	.576	

Table 14. Nitrate levels (µg-at/ℓ) in replicate samples in the water near the sediment traps at the eight stations in Ylig Bay on 1 II 1978.

STATION	NORTH	SOUTH	Σ
1	.48	.97	2.66
	.77	.44	
2	.29	1.7	3.63
	.44	1.2	
3	.73	.48	1.89
	.37	.31	
4	.68	.73	2.51
	.37	.73	
Σ	4.13	6.96	10.69

Source of Variation	df	MS	Fs
North versus South	1	.353	6.19*
Stations along a seaward gradient	3	.121	2.12 *ns*
Interaction of stations and side of bay	3	.286	5.02*
Error	8	.057	

Table 15. Paired comparisons of station S-1 versus N-1, S-2 versus N-2, S-3 versus N-3 and S-4 versus N-4, in terms of nitrate and phosphate contents of the water with all comparisons made between samples taken on the same dates. The data are given in Tables 11 through 14. The results of two-way anova are given here.

a) Nitrate levels in Fouha Bay

	df	MS	Fs
North versus South side of the bay	1	.045	.34 *ns*
Station pairs	16	.273	2.06 *ns*
Error	16	.133	

b) Phosphate levels in Fouha Bay

	df	MS	Fs
North versus South side of the bay	1	.000026	.06 *ns*
Station pairs	16	.0018	4.26**
Error	16	.0004	

c) Nitrate levels in Ylig Bay

	df	MS	Fs
North versus South side of the bay	1	3.02	6.71*
Station pairs	15	.83	1.84 *ns*
Error	15	.45	

d) Phosphate levels in Ylig Bay

	df	MS	Fs
North versus South side of the bay	1	.0003	.18 *ns*
Station pairs	15	.0034	2.14 *ns*
Error	15	.0016	

Suspended sediment load

Measurements of suspended sediment loads were made for eight continuous 6-week periods of time at each of our stations in both Fouha Bay and Ylig Bay (Tables 16 and 17). (Some of the samples are missing because the missing sediment load trap tubes were torn away by heavy wave action. Two of the time periods were longer than six weeks because hazardous wave conditions prevented us from collecting them on schedule. Each of the data for the delayed collection were adjusted for comparison with data from 6-week exposures as explained at the bottom of the tables.)

In contrast to our nitrate and phosphate data, our continuous sampling of suspended sediment loads in tubes provided us with data that had essentially negligible variance between replicate samples (error variance, cf. Tables 18 and 19). Because of this, we could clearly determine the sources of variance (Tables 18 and 19). There was a significant difference between the suspended sediment loads from each of the stations. These differences were caused in large part by a major decrease in suspended sediment load along a gradient from the river mouth towards the open sea. The stations also differed significantly in a comparison of counterpart stations on the north and south sides of the bay. All stations on the south side of the bays differed from their counterpart stations on the north sides of the bays. However, the direction of these differences alternated. In Fouha Bay, Stations N-1, S-2, N-3 and S-4 had greater average suspended sediment loads than their respective counterparts S-1, N-2, S-3 and N-4. In Ylig Bay, Stations S-1, N-2, S-3 and N-4 had greater average suspended sediment loads than their respective counterparts N-1, S-2, N-3 and S-4.

There were also very significant differences between the average suspended sediment loads from different 6-week time periods (Tables 18 and 19). We observed these differences to be related to wave action. After periods of storm and heavy wave action, our suspended sediment load measurements were always larger.

The direction and strength of winds and wave action on both of the bays varied between time periods to the extent that the relative differences between stations changed with time, i.e., there was a significant interaction between time periods and stations (Tables 18 and 19).

Ylig Bay is a relatively large bay, with relatively great distances between stations, while Fouha Bay is smaller, with the stations closer together. Fouha Bay is generally protected from heavy wave action, but when occasionally subjected to storm waves the entire small bay is strongly affected. These aspects of a comparison between Fouha Bay and Ylig Bay can be observed in Tables 18 and 19. Note that the variance (MS = mean square) between 6-week periods is over three times as great as the variance between stations in Fouha Bay, while the variance between stations is nearly three times as great as the variance between 6-week periods

Table 16. Dry weights (in gms) of sediments collected in sediment trap tubes (4.4 cm^2 aperture area) over 6-week periods in Fouha Bay. The mean and standard deviation are given for dry weights from a series of four tubes (n=4) at each station on each collecting date. Stations S-5 and N-5 were set up for only the last two collections. (Several collections are missing from the last four dates because of heavy wave action.)

FOUHA BAY

	Dates on which samples were taken							
STATIONS	23 III 77	4 V 77	15 VI 77	28 VII 77	22 IX 77*	3 XI 77	15 XII 77	2 II 78**
S - 1	10.57 ± 2.17	.61 ± .01	1.39 ± .73	3.04 ± .26	92.4 ± 5.56	92.88 ± 10.98	105.98 ± 11.80	
S - 2	4.31 ± 2.79	.23 ± .09	.68 ± .31	1.97 ± .91			72.80 ± 4.50	.81 ± .96
S - 3	1.94 ± .18	.12 ± .01	.22 ± .13	.91 ± .22			16.04 ± 1.79	
S - 4	1.16 ± .20	.08 ± .01	.30 ± .08	.48 ± .12				.87 ± .20
S - 5							103.12 ± 9.88	8.72 ± 1.12
N - 1	7.17 ± .23	.35 ± .18	1.66 ± .13	2.78 ± .20		90.83 ± 14.05	114.53 ± 7.04	
N - 2	2.79 ± .05	.28 ± .06	1.15 ± .08	1.91 ± .28	46.65 ± 9.12	37.64 ± 2.07	55.75 ± 3.04	1.73 ± 1.19
N - 3	2.36 ± .28	.33 ± .11	.98 ± .07	1.28 ± .04	35.32 ± 2.91	22.82 ± .83	31.28 ± 2.04	1.10 ± .66
N - 4	.67 ± .06	.11 ± .02	.23 ± .10	.56 ± .02			2.12 ± .14	.37 ± .04
N - 5							8.95 ± .37	3.21 ± 2.92

*The data from this 8-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/8)

**The data from this 7-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/7).

Table 17. Dry weights (in gms) of sediments collected in sediment trap tubes (4.4 cm^2 aperture area) over 6-week periods in Ylig Bay. The mean and standard deviation are given for dry weights from a series of four tubes (n=4) at each station on each collecting date. (The last collection from Station N-4 is missing because the set of tubes was presumably carried away by wave action.)

YLIG BAY

Dates on which samples were taken

STATIONS	30 III 77	11 V 77	22 VI 77	4 VIII 77	29 IX 77*	11 XI 77	22 XII 77	9 II 78**
S - 1	39.29 ± .99	35.55 ± .20	28.41 ± .99	29.15 ± 1.88	12.66 ± 3.00	56.70 ± .77	11.52 ± .92	51.51 ± 1.75
S - 2	4.35 ± .59	2.37 ± .09	1.16 ± .17	1.97 ± .55	1.28 ± .90	9.52 ± 1.12	4.26 ± .33	12.09 ± .47
S - 3	4.36 ± .15	4.11 ± .21	1.93 ± .50	1.42 ± .72	2.64 ± .12	13.32 ± .42	9.40 ± .42	8.87 ± .79
S - 4	3.23 ± .11	2.61 ± .18	1.32 ± .14	1.98 ± .12	1.18 ± .12	7.29 ± .27	3.17 ± 1.53	7.26 ± .27
N - 1	7.29 ± .67	6.46 ± .53	1.32 ± .83	1.98 ± .82	9.22 ± 3.49	33.83 ± 10.85	62.22 ± 1.01	22.98 ± 1.21
N - 2	7.16 ± .64	4.72 ± .52	1.43 ± .74	2.20 ± .65	7.36 ± 2.58	21.56 ± 1.34	7.06 ± .32	16.56 ± 7.20
N - 3	3.63 ± .13	3.26 ± .23	1.33 ± .29	2.03 ± .31	2.35 ± .35	7.03 ± .38	3.39 ± .22	10.71 ± .20
N - 4	3.78 ± .09	2.82 ± .10	1.77 ± .09	2.29 ± .38	1.67 ± .25	9.00 ± 1.21	2.81 ± .02	

*The data from this 8-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/8).

**The data from this 7-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/7).

Table 18. Analysis of sources of variation in suspended sediment load measurements in Fouha Bay.

Source of Variation	df	MS	Fs
Between 6-week periods	3	80.3	177.3***
Between stations	7	24.4	53.9***
Interaction of stations with 6-week periods	21	8.9	19.7***
Error (between 4 tubes at each station)	96	.453	

Table 19. Analysis of sources of variation in suspended sediment load measurements in Ylig Bay.

Source of Variation	df	MS	Fs
Between 6-week periods	6	967.6	323***
Between stations	7	2711.9	904***
Interaction of stations with 6-week periods	42	343.8	114.6***
Error (between 4 tubes of each station)	168	2.999	

Table 20. Average suspended sediment load measurements (gms dry weight) for 4.4 cm^2 I.D. tubes over 6-week periods at sampling stations in Fouha Bay and Ylig Bay from March 1977 through February 1978. (Refer to the text for the method of calculation used.)

	SIDE OF BAY	
STATION	SOUTH	NORTH
Fouha Bay		
1	38.8	42.1
2	24.65	18.5
3	6.04	11.9
4	6.25	1.24
5	38.6	4.20
Ylig Bay		
1	33.1	18.2
2	4.62	8.50
3	5.76	4.22
4	3.50	4.42

in Ylig Bay.

The differences in average suspended sediment load between stations might be related to characteristics of the marine communities at these stations. To obtain a comparative index of the suspended sediment load for each station, an average was taken over the eight 6-week period measurements for each station for which all eight sets of measurements were available (Table 20). Since data were missing for some of the stations during certain 6-week periods, and because there were significant differences between 6-week periods, the relative magnitudes of available measurements on suspended sediment loads from stations with missing 6-week periods were compared with measurements from the same 6-week periods from data of stations with complete data for eight 6-week periods. Because of the significant differences between 6-week periods, the average of suspended sediment load measurements from the incomplete stations were multiplied by a factor of a mean ratio from the complete stations of the total eight 6-week periods average from each station divided by the average of those 6-week periods that were available in the incomplete stations and were used in the comparisons. Although this derived index is weak because there is a significant interaction between stations and 6-week periods, the variance from the interaction is much less than the variances from the 6-week periods and stations (Tables 18 and 19). Therefore, the index we use is permissible and it is the best one we can derive under the circumstances.

Corals

The results of the survey of characteristics of the coral community are presented in Tables 21 to 29 and are discussed in the following section in relation to the suspended sediment load measurements. The distributions among the eight stations in both of the bays of each of the 161 species of corals are given in Table 21. The data on abundance and prevalence of each of the coral species are given in Table 22 for Fouha Bay and in Table 23 for Ylig Bay. Size distributions of coral populations on different zones of the reef are given for each of the stations for Fouha Bay in Table 24 and for Ylig Bay in Table 25. Frequency distributions for coral colony diameters for each of the zones at each of the stations are given in Tables 26 and 27 and the frequency distributions of colony growth forms are given in Tables 28 and 29.

Table 21. Species list of corals for Fouha and Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
CLASS - ANTHOZOA																
ORDER - SCLERACTINIA																
SUBORDER - ASTROCOENIINA																
FAMILY - ASTROCOENIIDAE																
Stylocoeniella armada (Ehrenberg)		X	X	X		X	X	X		X	X	X		X	X	X
Stylocoeniella guentheri (Bassett-Smith)				X							X				X	
FAMILY - THAMNASTERIIDAE																
Psammocora contigua (Esper)		X	X	X		X	X	X				X		X	X	
Psammocora digitata Milne-Edwards and Haime			X	X				X				X				X
Psammocora nierstraszi vander Horst			X	X		X	X				X	X			X	X
Psammocora (*Plesioseris*) *haimeana* Milne Edwards and Haime			X	X			X	X			X	X			X	X
Psammocora (Encrusting sp. 1)		X	X	X	X	X	X	X		X	X	X		X	X	X
Psammocora (Ramose sp. 1)				X							X	X		X		
FAMILY - POCILLOPORIDAE																
Stylophora mordax (Dana)		X	X	X		X	X	X			X	X			X	X
Seriatopora hystrix (Dana)				X							X					
Pocillopora brevicornis Lamarck																X
Pocillopora damicornis (Linnaeus)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pocillopora danae Verrill			X	X			X	X		X		X			X	
Pocillopora elegans Dana			X	X			X	X			X	X			X	X
Pocillopora eydouxi Milne Edwards & Haime				X						X		X			X	X
Pocillopora ligulata Dana			X	X				X			X	X				X
Pocillopora meandrina Dana			X	X			X	X		X	X	X		X	X	X
Pocillopora setchelli Hoffmeister			X	X			X	X		X	X	X			X	X
Pocillopora verrucosa (Ellis & Solander)			X	X				X				X				X
Pocillopora woodjonesi Vaughan			X	X			X	X				X				X
Pocillopora (Ramose sp. 1)			X	X			X	X				X				

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
Acropora brueggemanni (Brook)				X											X	
Acropora delicatula (Brook)			X									X				X
Acropora formosa (Dana)			X													X
Acropora humilis (Dana)			X	X			X	X				X			X	X
Acropora hystrix (Dana)			X	X			X	X			X				X	X
Acropora irregularis (Brook)			X	X				X			X	X			X	X
Acropora kenti (Brook)				X						X						
Acropora monticulosa (Bruggemann)				X				X				X				X
Acropora nana (Studer)				X				X				X				X
Acropora nasuta (Dana)			X	X		X	X	X				X				X
Acropora ocellata Klunzinger				X				X				X				X
Acropora palifera (Lamarck)			X	X				X				X				X
Acropora palmerae Wells								X				X			X	X
Acropora rambleri (Bassett Smith)												X				
Acropora rayneri (Brook)																X
Acropora smithi (Brook)				X								X				X
Acropora squarrosa (Ehrenberg)				X								X				X
Acropora surculosa (Dana)			X	X			X	X			X	X			X	X
Acropora syringodes (Brook)				X				X			X	X		X		X
Acropora valida (Dana)				X				X				X				X
Acropora wardii Verrill			X	X		X	X	X				X		X	X	X
Acropora (Corymbose sp. 1)		X	X	X			X	X			X	X				X
Acropora (Corymbose sp. 2)			X	X			X			X	X	X				X
Astreopora gracilis Bernard			X	X				X			X					X
Astreopora listeri Bernard				X								X				
Astreopora myriophthalma (Lamarck)		X	X	X			X	X			X	X			X	X
Astreopora (Massive sp. 1)				X								X				
Montipora acanthella Bernard		X				X					X					
Montipora caliculata (Dana)				X										X		
Montipora elschneri Vaughan		X	X	X		X	X	X		X	X	X		X	X	X
Montipora ehrenbergii Verrilli												X				
Montipora foliosa (Pallas)				X								X				X
Montipora foveolata (Dana)			X	X			X	X			X	X				X
Montipora granulosa Bernard				X								X				
Montipora hoffmeisteri Wells		X	X	X		X	X	X		X	X	X		X	X	X
Montipora lobulata Bernard			X	X			X	X		X		X		X	X	X
Montipora monasteriata (Forskaal)				X								X				

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
Montipora patula Verrill			X	X				X		X	X				X	X
Montipora sinensis Bernard				X							X	X				
Montipora socialis Bernard			X	X			X	X				X				X
Montipora tuberculosa (Lamarck)			X	X		X	X	X						X	X	X
Montipora verrilli Vaughan		X	X	X		X	X	X	X	X	X	X	X	X	X	X
Montipora verrucosa (Lamarck)			X	X			X	X			X	X		X	X	X
Montipora (Tuberculate sp. 1)		X	X	X		X	X	X		X	X	X		X	X	X
Montipora (Tuberculate sp. 2)		X	X	X		X	X	X		X	X	X			X	X
Montipora (Tuberculate sp. 3)														X		
Montipora (Papillate sp. 1)			X	X			X	X			X	X				X
Montipora (Papillate sp. 2)			X	X			X	X				X		X	X	X
Montipora (Foeolate sp. 1)				X								X				
Montipora (Glabrous sp. 1)			X	X								X		X		
SUBORDER - FUNGIINA																
FAMILY - AGARICIIDAE																
Agariciella planulata (Dana)			X	X		X	X				X	X				X
Pavona clavus (Dana)				X				X				X				X
Pavona decussata Dana		X		X							X				X	
Pavona divaricata (Lamarck)	X	X		X		X				X						
Pavona maldivensis (Gardiner)				X								X				X
Pavona minuta Wells			X	X			X	X			X	X			X	X
Pavona varians Verrill		X	X	X		X	X	X		X	X	X		X	X	X
Pavona (Polyastra) obtusata (Quelch)		X	X	X		X	X	X		X	X	X		X	X	X
Pavona (Polyastra) venosa Ehrenberg		X	X	X		X	X	X		X	X	X		X	X	X
Pavona (Pseudocolumnastraea) pollicata Wells			X	X			X					X			X	
Pavona (Polyastra) (Encrusting) sp. 1		X	X	X			X	X		X	X	X			X	
Pavona (Explanate sp. 1)			X	X							X					
Leptoseris hawaiiensis Vaughan			X	X			X				X	X			X	X
Leptoseris incrustans (Quelch)		X	X	X		X	X	X			X	X			X	X
Leptoseris mycetoseroides Wells			X	X			X	X			X	X			X	X
Pachyseris speciosa (Dana)			X	X			X	X			X	X			X	X
FAMILY - SIDERASTREIDAE																
Coscinaraea columna (Dana)			X	X			X	X				X				

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
FAMILY - FUNGIIDAE																
Fungia (*Verrillofungia*) *concinna* Verrill			X													
Fungia (*Fungia*) *fungites* (Linnaeus)			X								X					
Fungia (*Pleuractis*) *scutaria* (Lamarck)			X				X									
FAMILY - PORITIDAE																
Goniopora arbuscula Umbgrove				X				X			X					
Goniopora columna Dana			X				X				X				X	
Goniopora lobata Milne-Edwards and Haime				X								X			X	
Goniopora tenuidens (Quelch)			X	X			X	X			X	X			X	X
Porites andrewsi Vaughan			X	X			X	X			X	X			X	
Porites annae Crossland				X										X		
Porites australiensis Vaughan		X	X	X		X	X	X			X	X		X	X	X
Porites lutea Milne-Edwards and Haime	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Porites lobata Dana		X	X	X		X	X	X			X	X		X	X	X
Porites murrayensis Vaughan			X	X			X				X	X				X
Porites lichen Dana			X	X			X	X				X		X		X
Porites mordax Dana				X			X	X			X					
Porites superfusa Gardiner				X				X		X	X	X		X	X	X
Porites (*Synaraea*) *convexa* Verrill		X	X	X		X	X	X			X	X			X	X
Porites (*Synaraea*) *horizontalata* Hoffmeister		X	X	X		X	X	X			X	X			X	X
Porites (*Synaraea*) *iwayamaensis* Eguchi		X	X	X			X	X			X	X			X	X
Porites (*Synaraea*) *monticulosa* (Dana)			X	X		X					X	X			X	X
Porites (*Synaraea*) *vaughani* Crossland		X	X	X		X	X	X			X	X			X	X
Alveopora (Explanate sp. 1)			X	X				X			X	X			X	X
SUBORDER - FAVIINA																
FAMILY - FAVIIDAE																
Favia favus (Forskaal)		X	X	X		X	X	X		X	X	X		X	X	X
Favia matthai Vaughan			X	X			X	X			X	X			X	X
Favia pallida (Dana)		X	X	X		X	X	X		X	X	X	X	X	X	X
Favia rotulosa (Ellis and Solander)												X				
Favia rotumana (Gardiner)			X	X			X	X			X	X				X
Favia russelli (Wells)		X	X	X		X	X	X			X	X			X	X

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLLG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
Favia speciosa (Dana)			X	X			X	X		X	X	X		X	X	X
Favia stelligera (Dana)			X	X				X				X			X	X
Favites abdita (Ellis and Solander)			X	X				X				X				X
Favites flexuosa (Dana)				X				X			X	X			X	X
Favites virens (Dana)			X	X		X	X					X				
Oulophyllia crispa (Lamarck)			X	X							X					X
Goniastrea edwardsi Chevalier		X	X	X		X	X	X		X	X	X		X	X	X
Goniastrea pectinata (Ehrenberg)			X	X			X				X	X			X	X
Goniastrea retiformis (Lamarck)		X	X	X		X	X	X		X	X	X	X	X	X	X
Platygyra daedalea (Ellis and Solander)			X	X			X	X			X	X		X	X	X
Platygyra pini Chevalier			X	X			X	X		X	X	X			X	X
Leptoria phrygia (Ellis and Solander)			X	X		X	X	X		X	X	X		X	X	X
Hydnophora microconos (Lamarck)			X	X				X		X	X	X		X	X	X
Plesiastrea versipora (Lamarck)				X				X			X				X	X
Montastrea curta (Dana)			X	X			X	X				X			X	X
Diploastrea heliopora (Lamarck)			X	X				X			X	X				X
Leptastrea bottae (Milne-Edwards and Haime)			X							X						
Leptastrea immersa Klunzinger										X						
Leptastrea purpurea (Dana)		X	X	X		X	X	X		X	X	X		X	X	X
Leptastrea transversa (Klunzinger)		X	X	X			X	X			X	X	X		X	X
Cyphastrea myriophthalma (Lamarck)			X	X				X			X			X		
Cyphastrea serailia (Forskaal)		X	X	X		X	X	X			X	X			X	X
Cyphastrea (Encrusting sp.)				X								X				
Echinopora lamellosa (Esper)			X	X		X	X	X		X		X				X
FAMILY - OCULINIDAE																
Galaxea clavus (Dana)			X								X					
Galaxea fascicularis (Linnaeus)			X	X			X				X	X			X	
Acrhelia horrescens (Dana)				X												
FAMILY - MUSSIDAE																
Lobophyllia corymbosa (Forskaal)			X	X			X	X			X	X				X
Lobophyllia costata (Dana)		X	X	X				X			X					X
Lobophyllia hemprichii (Ehrenberg)			X	X			X	X				X			X	
Symphillia valenciennesii Milne-Edwards & Haime				X								X				

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
Acanthastrea echinata (Dana)		X	X	X		X	X	X		X	X	X		X	X	X
Acanthastrea hillae Wells			X	X			X	X			X					
FAMILY - PECTINIIDAE																
Echinophyllia aspera (Ellis and Solander)			X	X			X	X		X	X	X			X	X
Mycedium (Explanate sp. 1)				X			X				X	X			X	X
SUBORDER - CARYOPHYLLIINA																
FAMILY - CARYOPHYLLIIDAE																
Euphyllia glabrescens (Chamisso and Eysenhardt)			X			X	X							X		
Euphyllia (Ramose sp. 1)														X	X	X
Plerogyra sinuosa (Dana)			X					X			X	X			X	X
Desmophyllum (Solitary sp. 1)			X	X			X	X				X				X
Polycyathus verrilli Duncan			X													
SUBORDER - DENDROPHYLLIINA																
FAMILY - DENDROPHYLLIIDAE																
Turbinaria (Foliaceous sp. 1)			X	X				X				X				X
ORDER - COENOTHECALIA																
FAMILY - HELIOPORIDAE																
Heliopora coerulea (Pallas)			X	X				X				X				X
CLASS - HYDROZOA																
ORDER - MILLEPORINA																
FAMILY - MILLEPORIDAE																
Millepora dichotoma Forskaal			X	X			X				X	X				X
Millepora foveolata Crossland		X	X	X			X	X		X	X	X		X	X	X
Millepora platyphylla Hemprich & Ehrenberg		X	X	X			X	X				X			X	X

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
ORDER - STYLASTERINA																
FAMILY - STYLASTERIDAE																
Distichopora sp. 1				X				X			X	X				X
TOTAL GENERA FOR STATIONS	2	17	40	42	3	18	32	35	3	16	34	38	6	17	31	38
TOTAL SPECIES FOR STATIONS	2	39	116	142	3	40	89	104	3	38	94	127	6	42	85	112
TOTAL GENERA - FOUHA 46 YLIG 44																
TOTAL SPECIES - FOUHA 155 YLIG 159																

Table 22. Coral frequency, density, and percent of substrate coverage at Fouha Bay sediment stations N-1 through N-4 and S-1 through S-4. Asterisks (*) indicate that coral frequency and density data were not collected.

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
FOUHA BAY - STATION N-1	(20 Quadrats)			(20 Quadrats)			(20 Quadrats)			(20 Quadrats)		
Porites lutea	No Corals Encountered			.05	.66	.32	.07	.45	.58	No Corals Encountered		
Totals					.66	.32	.07	.45	.58			
FOUHA BAY - STATION N-2	(20 Quadrats)			(16 Quadrats)			(11 Quadrats)			(16 Quadrats)		
Cyphastrea serailia							.07	.57	.37			
Pavona (P.) obtusata				.06	.39	.89						
Porites lutea	No Corals Encountered			.25	1.56	4.34	.14	1.14	3.71	.13	1.17	2.68
Porites (S.) vaughani							.07	.57	.37	.06	.39	.38
Psammocora (massive sp. 2)										.06	.39	.13
Psammocora (Encrusting sp. 1)							.07	.57	3.15	.06	.39	2.82
Totals					1.95	5.23		2.85	7.60		2.34	6.00
FOUHA BAY - STATION N-3	(20 Quadrats)			(20 Quadrats)			(10 Quadrats)			(32 Quadrats)		
Acanthastrea echinata	.05	.31	.10									
Agariciella				.05	.31	1.53						
Cyphastrea serailia				.10	.63	.71	*	*	.07			
Favia pallida	.10	.63	.51				*	*	.10			
Favia russelli				.05	.31	.20						
Galaxea fascicularis	.05	.31	.10									
Goniastrea edwardsi	.05	.31	.10							*	*	.02
Goniastrea retiformis	.20	1.88	3.67									
Leptastrea purpurea	.20	1.56	1.44									
Leptoseris incrustans							*	*	.07			
Millepora dichotoma							*	*	.12			
Millepora foveolata										*	*	.60

Table 22. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION N-3 continued												
Montipora elschneri	.05	.31	.20									
Montipora foveolata	.05	.31	.61									
Montipora hoffmeisteri				.05	.31	1.33						
Montipora verrilli	.05	.31	1.44	.15	1.56	1.43						
Montipora (Tuberculate sp. 1)										*	*	.07
Pavona (P.) venosa				.10	.63	2.35				*	*	.01
Platygyra pini	.05	.31	.10									
Pocillopora damicornis										*	*	.01
Pocillopora danae	.05	.31	.10									
Porites (S.) convexa				.25	1.56	7.65	*	*	37.88			
Porites (S.) iwayamaensis				.05	.31	2.24						
Porites lobata	.05	.31	.10	.10	.63	.20	*	*	.05			
Porites lutea	.10	.63	2.35	.10	1.24	7.77	*	*	5.29	*	*	3.78
Porites (S.) vaughani				.20	1.56	.61						
Psammocora contigua	.10	.63	.20									
Psammocora (Encrusting sp. 1)				.05	.31	2.35						
Stylophora mordax				.05	.31	.10	*	*	.01			
Totals		8.12	11.02		9.69	28.47			43.59			4.49
FOUHA BAY - STATION N-4	(20 Quadrats)			(20 Quadrats)			(35 Quadrats)			(32 Quadrats)		
Acanthastrea echinata				.10	.63	.20						
Acanthastrea hillae							*	*	.63			
Acropora humilis	.05	.31	.31									
Acropora irregularis	.05	.31	.10									
Acropora nasuta	.15	1.25	.71									
Acropora surculosa	.10	1.26	.51	.20	1.25	1.22				No Corals Encountered		
Acropora wardi	.15	.94	.41	.05	.31	.31						
Acropora (Corymbose sp. 1)	.05	.31	.51									
Astreopora myriophthalma				.05	.31	2.45						
Cyphastrea serailia				.05	.63	.20	*	*	.08			
Diploastrea heliopora	.05	.31	.20									

Table 22. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION N-4 continued												
Favia favus				.05	.31	.20						
Favia pallida	.05	.31	.10	.10	.63	.41	*	*	.93			
Favia rotumana				.05	.31	.10						
Favia russelli				.05	.31	.10						
Galaxea fascicularis	.05	.31	.10									
Goniastrea edwardsi				.10	.63	.61						
Goniastrea retiformis	.20	1.57	1.54	.15	.94	1.54						
Leptastrea purpurea	.05	.31	.10	.15	1.56	.71						
Leptastrea transversa				.05	.31	1.22						
Leptoria phrygia	.10	.63	.20									
Leptoseris incrustans							*	*	.06			
Lobophyllia costata				.05	.31	.41						
Millepora platyphylla				.10	.63	2.45						
Montipora elschneri				.05	.31	2.36	*	*	.05			
Montipora foveolata				.05	.31	.41						
Montipora hoffmeisteri							*	*	.09			
Montipora tuberculosa							*	*	.48			
Montipora verrilli				.30	2.50	2.24	*	*	.48			
Pavona (P.) venosa				.05	.31	.20						
Platygyra daedalea				.15	.94	1.64						
Pocillopora damicornis				.05	.31	.10						
Pocillopora danae	.05	.31	.10									
Pocillopora meandrina	.05	.31	.10									
Pocillopora setchelli	.20	1.56	.83	.05	.31	.10						
Porites (S.) convexa				.05	.31	.41	*	*	44.24			
Porites lobata	.05	.31	.10				*	*	.94			
Porites lutea	.15	.94	.61	.25	1.88	4.70	*	*	.62			
Porites murrayensis				.05	.31	1.02						
Psammocora contigua	.10	.94	.31									
Stylocoeniella armata				.05	.31	.10						
Stylophora mordax				.10	.63	.51	*	*	.06			
Totals		12.19	6.84		17.50	25.92			48.66			

Table 22. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
FOUHA BAY - STATION S-1	(20 Quadrats)			(20 Quadrats)			(20 Quadrats)			(20 Quadrats)		
Pocillopora damicornis							.05	.31	.10			
Porites lutea	No Corals Encountered			No Corals Encountered			.05	.31	.20	No Corals Encountered		
Totals								.62	.30			
FOUHA BAY - STATION S-2	(20 Quadrats)			(20 Quadrats)			(20 Quadrats)			(20 Quadrats)		
Agariciella				.05	.31	.71						
Cyphastrea serailia							.05	.31	.51			
Favia pallida	.05	.31	.20	.05	.31	.10						
Leptoseris incrustans							.15	1.57	.71			
Montipora hoffmeisteri				.10	.63	.61	.05	.31	.51			
Montipora tuberculosa				.05	.31	.51						
Montipora verrilli				.25	1.56	2.65				.05	.31	.41
Montipora (orange polyp)				.05	.31	.20						
Pavona (*P.*) *obtusata*				.05	.31	1.22						
Pavona (*P.*) *venosa*				.10	.63	2.45						
Pocillopora damicornis				.05	.31	.41						
Porites lutea	.20	2.19	2.25	.20	1.88	3.27	.15	.94	1.33	.10	.94	.61
Porites (*S.*) *vaughani*							.05	.31	.10			
Psammocora (Encrusting sp. 1)				.10	.63	3.87						
Stylophora mordax				.05	.31	.20						
Totals		2.50	2.45		7.50	16.21		3.44	3.16		1.25	1.02
FOUHA BAY - STATION S-3	(20 Quadrats			(20 Quadrats)			(25 Quadrats)			(15 Quadrats)		
Acropora wardi				.05	.31	.10						
Cyphastrea serailia							*	*	1.24	No Corals Encountered		
Goniastrea retiformis	.10	.63	.41									
Leptastrea purpurea	.05	.31	.10									
Montipora elschneri				.05	.31	.41						
Montipora hoffmeisteri	.05	.31	.20				*	*	13.96			
Montipora socialis							*	*	3.41			
Montipora tuberculosa									1.71			

Table 22. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION S-3 continued												
Montipora verrilli				.10	.63	2.66	*	*	11.17			
Montipora (Tuberculate sp. 1)							*	*	5.28			
Pavona (P.) obtusata	.05	.31	2.24	.04	.31	.31	*	*	1.70			
Pavona (P.) venosa	.05	.31	.20				*	*	.10			
Pavona (Explanate sp. 1)				.05	.31	.51						
Pocillopora elegans							*	*	.47			
Porites australiensis	.05	.31	.10									
Porites (S.) convexa				.05	.31	.10	*	*	10.65			
Porites (S.) horizontalata							*	*	.88			
Porites (S.) iwayamaensis	.05	.31	.20	.10	.63	3.16						
Porites lobata	.05	.31	.31	.05	.31	.10						
Porites lutea	.30	2.20	8.28	.25	1.87	7.86	*	*	.98	No Corals Encountered		
Porites (S.) vaughani				.10	.63	.20						
Psammocora contigua	.10	.94	.31									
Psammocora (Encrusting sp. 1)				.10	.63	.71						
Stylocoeniella armata							*	*	.10			
Totals		5.94	12.35		6.25	16.12			51.65			
FOUHA BAY - STATION S-4	(20 Quadrats)			(20 Quadrats)			(26 Quadrats)			(15 Quadrats)		
Acropora surculosa	.10	.63	.61	.05	.31	.41						
Acropora wardi	.10	.63	.71									
Cyphastrea myriophthalma	.05	.31	.20	.05	.31	.10	*	*	.04			
Echinopora lamellosa							*	*	.16			
Favia pallida	.05	.31	.20	.10	.63	.20	*	*	.78	No Corals Encountered		
Favia rotumana	.05	.31	.10	.05	.31	.10	*	*	.02			
Favia russelli	.05	.31	.10									
Goniastrea edwardsi	.05	.31	.20	.10	.63	.20						
Goniastrea retiformis	.15	.94	.71	.15	.94	1.02						
Hydnophora microconos	.05	.31	.20									
Leptastrea purpurea	.05	.31	.10	.15	.94	.41						
Leptastrea transversa	.05	.31	.20	.05	.31	.71						

Table 22. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION S-4 continued												
Lobophyllia corymbosa	.05	.31	.41									
Lobophyllia hemprichii	.05	.31	1.74									
Millepora platyphylla	.10	.63	.41									
Millepora foveolata	.10	.63	1.94									
Montipora elschneri							*	*	.67			
Montipora foveolata	.05	.31	.31	.05	.31	1.02						
Montipora hoffmeisteri	.05	.31	.10				*	*	.92			
Montipora tuberculosa	.05	.31	1.85	.05	.31	.92						
Montipora verrilli	.05	.31	.10	.20	1.56	4.70	*	*	1.54			
Montipora (Tuberculate sp. 1)							*	*	.02			
Platygyra daedalea	.15	.94	.61									
Platygyra pini				.05	.31	.10						
Pocillopora damicornis	.05	.31	.20									
Pocillopora verrucosa							*	*	.62			
Porites (S.) convexa				.10	.63	.92				No Corals Encountered		
Porites lobata	.05	.31	.10	.15	.94	.31						
Porites lutea	.55	3.45	4.82	.25	2.50	6.02	*	*	13.03			
Psammocora (Encrusting sp. 1)	.05	.31	.41	.05	.31	.61						
Stylocoeniella armata							*	*	.07			
Stylophora mordax	.10	.63	.51	.05	.31	.31						
Turbinaria sp. 1							*	*	.24			
Totals		13.75	16.84		11.56	18.06			18.11			

Table 23. Coral frequency, density, and percent of substrate coverage at Ylig Bay sediment stations N-1 through N-4 and S-1 through S-4. Asterisks (*) indicate that coral frequency and density data were not collected.

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
YLIG BAY - STATION N-1	(20 Quadrats)			(20 Quadrats)			(100 Quadrats)			(35 Quadrats)		
Porites lutea	No Corals Encountered			No Corals Encountered			*	*	.01	No Corals Encountered		
Totals									.01			
YLIG BAY - STATION N-2	(33 Quadrats)			(17 Quadrats)			(20 Quadrats)			(15 Quadrats)		
Favia pallida							.10	.63	.61	.07	.42	.14
Goniastrea retiformis	No Corals Encountered			.06	.34	.36						
Leptastrea purpurea							.10	.94	1.02			
Montipora lobulata				.06	.74	.48	.05	.31	.20			
Montipora verrilli				.12	.74	5.88	.10	.63	.91			
Montipora (Tuberculate sp. 1)							.05	.31	.41			
Pocillopora damicornis				.12	.34	1.20	.05	.31	.31	.07	.42	.41
Pocillopora setchelli				.06	.74	.96						
Porites lutea							.05	.31	.82			
Totals					2.90	8.88		3.43	4.28		.84	.55
YLIG BAY - STATION N-3	(32 Quadrats)			(35 Quadrats)			(12 Quadrats)			(30 Quadrats)		
Acropora irregularis				.03	.18	.52						
Favia favus							*	*	.01	No Corals Encountered		
Favia pallida	.03	.20	.26	.09	.54	.41	*	*	.57			
Goniastrea retiformis				.09	.54	2.39						
Goniopora (large lobate)	.03	.18	1.75									
Leptastrea purpurea				.03	.18	.17						
Leptastrea transversa				.03	.18	.12						
Montipora hoffmeisteri				.03	.18	.59	*	*	2.41			
Montipora verrilli				.20	2.32	6.01	*	*	1.10			
Montipora verrucosa							*	*	.57			
Montipora sinensis				.06	.36	.23						
Montipora (Papillate sp. 1)				.03	.18	2.86						
Montipora (Tuberculate sp. 1)									22.47			

Table 23 . continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION N-3 continued.												
Pavona (P.) obtusata							*	*	.42			
Pavona (P.) venosa				.03	.18	.52						
Pocillopora damicornis				.06	.36	.35	*	*	.04			
Pocillopora setchelli				.09	.54	.35						
Porites lutea	.03	.20	2.93				*	*	16.56	No Corals Encountered		
Psammocora (Encrusting sp. 1)				.03	.18	1.34	*	*	.25			
Totals		.40	3.19		6.1	17.61			44.40			
YLIG BAY - STATION N-4	(45 Quadrats)			(26 Quadrats)			(16 Quadrats)			(16 Quadrats)		
Acropora irregularis				.04	.24	.09						
Cyphaetrea (Encrusting sp. 1)							*	*	.01			
Favia matthai				.04	.24	.63						
Favia pallida	.04	.28	.23				*	*	.16			
Favia rotumana				.08	.48	.86	*	*	.02			
Favia russelli	.02	.14	.09	.04	.24	.30						
Favia speciosa	.02	.14	.32				*	*	.03	*	*	.02
Galaxea fascicularis							*	*	.02			
Goniastrea retiformis	.04	.28	.23									
Goniopora tenuidens										*	*	.86
Heliopora coerulea				.04	.24	2.51						
Hydnophora microconos				.04	.24	.16						
Leptastrea purpurea							*	*	.06			
Leptoseris mycetiserioides				.04	.72	.30						
Merulina ampliata							*	*	.02			
Montipora erhrenbergii				.08	.48	.86						
Montipora lobulata				.12	.72	2.28	*	*	.83			
Montipora verrilli	.11	1.11	2.12	.27	1.91	8.47	*	*	.79			
Montipora verrucosa										*	*	.01
Montipora (Glabrous sp. 1)	.02	.14	.18									
Pavona minuta							*	*	1.57	*	*	.66
Pavona (P.) obtusata							*	*	3.95	*	*	.01
Pocillopora meandrina	.04	.28	.14									

Table 23. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION N-4 continued												
Pocillopora setchelli	.02	.14	.05	.04	.24	.24						
Plerogyra sinuosa							*	*	.07			
Porites (S.) *horizontalata*							*	*	.05			
Porites (S.) *iwayamaensis*				.08	.48	.94	*	*	.17			
Porites lutea	.11	1.38	1.49	.15	2.87	4.40	*	*	12.62			
Psammocora (Encrusting sp. 1)							*	*	4.90			
Stylocoeniella armata	.02	.14	.05	.04	.24	.09	*	*	.01			
Totals		4.03	4.92		9.38	22.13			25.28			1.56
YLIG BAY - STATION S-1	(20 Quadrats)			(20 Quadrats)			(40 Quadrats)			(40 Quadrats)		
Porites lutea	No Corals Encountered			.05	.31	1.22	No Corals Encountered			No Corals Encountered		
Totals					.31	1.22						
YLIG BAY - STATION S-2	(20 Quadrats)			(20 Quadrats)			(20 Quadrats)			(20 Quadrats)		
Favia favus				.05	.31	.61	.05	.31	.10	.05	.31	.10
Favia pallida							.10	.63	.20			
Goniastrea retiformis	.05	.31	.10	.05	.31	.10						
Montipora hoffmeisteri				.10	.63	.71	.10	.63	1.33	.05	.31	.31
Montipora lobulata				.15	.94	2.35	.05	.31	.71	.05		.71
Montipora verrilli				.10	.63	1.33						
Montipora (Tuberculate sp. 1)							.05	.31	.10	.05	.31	.20
Pocillopora damicornis	.05	.31	.10	.05	.31	.61	.05	.31	.20			
Porites lutea	.05	.31	.20	.10	.63	2.24	.15	.94	2.35	.05	.31	.10
Psammocora contigua	.05	.31	.10									
Totals		1.24	.50		3.76	7.95		3.44	4.99		1.24	1.42

Table 23. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
YLIG BAY - STATION S-3	(32 Quadrats)			(32 Quadrats)			(16 Quadrats)			(8 Quadrats)		
Acanthastrea echinata	No Corals Encountered			.06	.39	.57				No Corals Encountered		
Acropora wardi				.03	.20	.06						
Alveopora (Explanate sp. 1)							*	*	.89			
Favia favus							*	*	.27			
Favia pallida							*	*	.15			
Favia speciosa				.03	.20	.06	*	*	1.16			
Favia stelligera							*	*	.93			
Goniastrea edwardsi							*	*	.54			
Goniastrea retiformis				.22	1.76	4.59						
Hydnophora microconos							*	*	.91			
Leptastrea purpurea				.03	.20	.38	*	*	.37			
Leptoria phrygia							*	*	.89			
Montipora hoffmeisteri							*	*	3.54			
Montipora lobulata				.06	.59	.77						
Montipora verrilli				.13	.98	3.44	*	*	10.21			
Montipora verrucosa							*	*	2.21			
Montipora (Papillate sp. 2)				.06	.39	3.32						
Montipora (Tuberculate sp. 1)							*	*	1.75			
Pocillopora damicornis							*	*	.05			
Pocillopora setchelli				.03	.20	.38						
Porites lutea				.03	.20	3.13						
Stylocoeniella armata				.03	.20	.13						
Totals					5.27	16.83			23.87			
YLIG BAY - STATION S-4	(29 Quadrats)			(37 Quadrats)			(16 Quadrats)			(8 Quadrats)		
Acanthastrea echinata				.05	.34	.17				No Corals Encountered		
Acropora irregularis	.03	.22	.21	.05	.34	.11						
Acropora nana				.03	.17	.17						
Acropora surculosa	.03	.22	.35	.03	.17	.50	*	*	1.22			
Acropora wardi	.03	.22	.07									
Alveopora (Explanate sp. 1)							*	*	1.63			
Favia stelligera							*	*	1.02			

Table 23. continued

	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
STATION S-4 continued												
Goniastrea edwardsi				.03	.17	.06	*	*	1.02			
Goniastrea retiformis	.10	.63	2.32	.19	1.51	2.26						
Hydnophora microconos							*	*	1.34			
Leptastrea purpurea	.03	.22	.21									
Leptastrea transversa				.03	.17	.11						
Leptoria phrygia	.14	1.07	2.26	.05	.34	.77						
Montastrea curta				.03	.17	.17						
Montipora lobulata							*	*	16.36			
Montipora verrilli				.16	1.01	1.87						
Montipora (Papillate sp. 2)				.03	.17	.61						
Montipora (Papillate sp. 1)				.05	.34	.88						
Pavona varians							*	*	8.56			
Platygyra pini							*	*	.58			
Pocillopora brevicornis				.03	.17	.06						
Pocillopora eydouxi				.03	.17	.83						
Pocillopora meandrina				.03	.17	.71				No Corals Encountered		
Pocillopora setchelli	.03	.22	.07	.19	1.18	2.86	*	*	.58			
Porites superfusa	.10	1.51	.42				*	*	1.46			
Porites (S.) vaughani	.03	.22	.07	.03	.17	.11						
Stylocoeniella armata							*	*	.03			
Totals		4.53	5.98		6.76	12.25			33.80			

Table 24. Size distribution of corals at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Fouha Bay - Station N-1																
Pavona divaricata					1	8.0	-	-								
Porites lutea	4	6.5	3.7	3-11												
TOTALS	4	6.5	3.7	3-11	1	8.0	-	-								
Fouha Bay - Station N-2																
Acropora (Corymbose sp. 1)					1	15.0	-	-								
Astreopora myriophthalma									1	8.0	-	-				
Cyphastrea serailia									2	6.7	2.9	6-8				
Favia pallida													1	5.0	-	-
Favia russelli									1	4.0	-	-				
Goniastrea retiformis					1	6.0	-	-								
Leptastrea purpurea									1	4.0	-	-	1	3.0	-	-
Leptastrea transversa					1	6.0	-	-								
Lobophyllia costata									1	8.0	-	-				
Millepora platyphylla													1	8.0	-	-
Millepora verrucosa													1	29.0	-	-
Montipora acanthella									2	30.0	11.3	22-38				
Montipora elschneri									1	29.0	-	-				
Montipora hoffmeisteri					1	12.0	-	-					1	8.0	-	-
Montipora verrilli					2	18.5	16.3	7-30								
Montipora (Tuberculate sp. 1)									1	29.0	-	-				
Montipora (Tuberculate sp. 2)									1	25.0	-	-	2	70.0	7.1	65-75
Pavona decussata									1	22.0	-	-				
Pavona divaricata									1	20.0	-	-				
Pavona (P.) *obtusata*									2	17.0	12.7	8-26				
Pavona (P.) (Encrusting sp. 1)					1	6.0	-	-								
Pocillopora damicornis					1	5.0	-	-					1	4.0	-	-
Porites australiensis													1	21.0	-	-
Porites lutea	4	4.3	2.6	2-8	2	36.5	47.4	3-75								
Porites (S.) *vaughani*													1	6.0	-	-
Psammocora (Encrusting sp. 1)									1	22.0	-	-				
Psammocora (Massive sp. 2)									1	3.0	-	-				
Stylophora mordax													1	6.0	-	-
TOTALS	4	4.3	2.6	2-8	10	16.54	22.0	3-75	17	17.9	11.2	3-38	11	20.9	25.6	3-75

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Fouha Bay - Station N-3																
Acanthastrea echinata	8	7.1	2.6	4-12	1	12.0	-	-								
Acanthastrea hillae					1	31.6	-	-								
Acropora hystrix					1	8.0	-	-								
Acropora humilis					2	25.0	4.2	22-28								
Acropora nasuta	7	6.6	3.9	3-12												
Acropora surculosa	1	8.0	-	-	2	11.5	0.7	11-12								
Acropora wardii					2	20.5	13.4	11-30								
Agariciella planulata					2	37.6	17.5	25.2-50	1	85.0	-	-				
Alveopora (Explanate sp. 1)									2	77.5	60.1	35-120				
Coscinaraca columna					1	200.0	-	-								
Cyphastrea myriophthalma					3	20.3	8.7	13-30	6	8.0	3.2	3.5-13				
Echinopora lamellosa					1	40.0	-	-								
Favia favus					2	5.0	1.4	4-6								
Favia pallida	7	6.4	2.9	3-11					7	7.9	5.9	1-15.3				
Favia russelli	2	3.5	0.7	3-4	5	8.0	3.4	4-13								
Galaxea fascicularis	4	5.7	1.2	4-6.8	2	15.0	4.2	12-18								
Goniastrea edwardsi	2	7.9	1.3	7-8.8	2	13.5	2.1	12-15					1	8.9	-	-
Goniastrea pectinata					2	34.0	22.6	18-50								
Goniastrea retiformis	13	13.8	8.1	2-32	3	20.7	10.3	12-32								
Leptastrea purpurea	9	5.5	4.8	2.8-18.2												
Leptoria phrygia	7	11.3	6.1	3.5-22	3	23.3	7.6	18-32								
Leptoseris incrustans									14	5.6	5.1	1.5-21.2				
Leptoseris mycetoseroides					3	7.7	3.8	5-12								
Lobophyllia costata					1	50.0	-	-								
Millepora dichotoma					6	12.2	8.7	4-28	7	9.5	5.2	4.2-18.2				
Millepora foveolata													2	38.3	8.1	32.5-
Millepora platyphylla	2	125.0	7.1	120-130												
Montrastrea curta	4	7.6	3.1	4.6-11	1	8.0	-	-								
Montipora elschneri	5	7.6	4.3	3-12	2	100.0	0.0	100-100								
Montipora foveolata	3	44.9	15.6	33.8-55.9												
Montipora hoffmeisteri					2	32.0	11.3	24-40								
Montipora verrilli	2	20.0	18.5	6.9-33	5	12.8	11.2	4-32								
Montipora (Tuberculate sp. 1)					1	35.0	-	-					2	12.3	7.9	6.7-17
Montipora (Glabrous sp. 1)									1	25.0	-	-				

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Montipora (Papillate sp. 1)	1	13.0	-	-												
Pachyseris speciosa									1	56.0	-	-				
Polycyathus verrilli	1	1.0	-	-												
Pavona minuta					1	59.0	-	-								
Pavona varians					3	10.3	8.4	5-20								
Pavona (P.) obtusata	2	11.0	1.4	10-12	3	71.0	27.6	45-100								
Pavona (P.) pollicata									1	38.7						
Pavona (P.) venosa					2	52.5	47.4	19-86					1	6.3	-	-
Platygyra daedolea	1	8.0	-	-	5	91.6	48.0	45-170								
Platygyra pini	1	3.0	-	-	3	64.0	34.2	32-100								
Pocillopora damicornis					3	4.0	1.7	3-6					4	4.1	1.7	2-5.
Pocillopora danae	2	9.0	5.7	5-13	3	13.8	4.2	12-17								
Pocillopora setchelli	1	25.0	-	-	1	19.0	-	-								
Pocillopora verrucosa					1	30.0	-	-								
Pocillopora (Ramose sp. 1)					1	16.0	-	-								
Porites australiensis	4	31.2	31.8	12.2-78.7	2	45.7	6.1	41.4-50								
Porites murrayensis					2	97.5	31.8	75-120								
Porites lobata	7	5.1	3.2	3-12	2	4.8	1.1	4-5.5	5	4.0	3.0	1.5-7.5				
Porites lutea	11	18.3	15.2	2-55	5	69.1	74.2	23-200	2	101.1	117.2	18.2-184	22	17.4	24.0	3-113
Porites (S.) convexa					5	98.6	74.0	24.5-200	20	70.3	87.2	2.4-290				
Porites (S.) horizontalata					1	63.2	-	-								
Porites (S.) iwayamaensis					2	86.0	76.4	32-140	2	175.0	106.1	100-250				
Porites (S.) monticulosa					1	70.7	-	-								
Porites (S.) vaughani					5	4.4	1.5	2-6								
Psammocora contigua	8	6.9	3.9	3-14.1					1	90.0	-	-				
Psammocora (Encrusting sp. 1)					1	184.4	-	-								
Stylophora mordax					4	11.0	6.8	4-20								
Turbinaria (Explanate sp. 1)					1	80.0	-	-	1	3.9	-	-				
TOTALS	115	12.9	19.2	1-130	113	37.3	45.3	2-200	71	38.2	64.0	1-290	32	16.1	21.2	2-11
Fouha Bay - Station N-4																
Acanthastrea echinata					2	4.0	0.0	4-4					No Corals Encountered			
Acanthastrea hillae					5	101.6	73.4	30-200	8	12.1	16.3	3-52				
Acropora humilis	4	10.3	1.7	8-12	1	22.0	-	-								
Acropora hystrix	2	19.5	4.9	16-23	3	15.0	3.0	12-18								
Acropora irregularis	2	7.5	2.1	6-9												
Acropora kenti					2	33.2	1.1	32.4-34								

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Acropora nana	3	7.0	5.6	2-13												
Acropora nasuta	11	10.8	7.0	4-26.9												
Acropora squarrosa					2	12.5	0.7	12-13								
Acropora surculosa	8	6.8	2.1	4-11	5	9.8	3.1	7-15								
Acropora wardii	4	7.0	1.4	6-9	1	11.0	-	-								
Acropora (Corymbose sp. 1)	2	11.0	7.1	6-16												
Agariciella planulata					2	44.5	6.4	40-49								
Alveopora (Explanate sp. 1)					2	68.0	22.6	52-84								
Astreopora myriophthalma					1	52.7	-	-								
Cyphastrea serailia	1	4.6	-	-	2	5.5	0.7	5-6	7	7.0	3.3	2.2-12.6				
Diploastrea heliopora	2	36.0	19.9	21.9-50												
Favia favus					1	6.9	-	-	2	16.5	8.3	10.6-22.4				
Favia pallida	2	6.5	2.2	4.9-8	2	8.0	0.0	8-8	1	67.1	-	-				
Favia rotumana	1	8.0	-	-	1	10.0	-	-								
Favia russelli					1	6.0	-	-								
Favia stelligera					2	31.8	3.1	29.6-34								
Favites flexuosa	1	29.0	-	-												
Favites virens					1	37.0	-	-								
Galaxea fascicularis	1	7.0	-	-												
Goniastrea edwardsi					2	13.3	1.0	12.6-14	2	60.0	14.1	50-70				
Goniastrea pectinata					1	50.0	-	-								
Goniastrea retiformis	12	8.7	3.9	4.9-19	8	22.9	21.3	4-56								
Goniopora arbuscula	1	22.0	-	-												
Hydnophora microcenos	1	12.0	-	-												
Leptastrea purpurea	1	6.0	-	-	6	6.2	2.4	4-10								
Leptastrea transversa	1	12.0	-	-	1	38.7	-	-								
Leptoria phrygia	3	14.4	4.2	12-19.2												
Leptoseris incrustans									9	4.7	3.1	2-10.9				
Lobophyllia corymbosa					7	54.3	26.5	30-100								
Lobophyllia costata					5	41.1	15.0	25-64								
Lobophyllia hemprichii					8	62.1	29.8	25-100								
Millepora platyphylla					2	20.6	23.4	4-37.1								
Montipora caliculata					1	20.0	-	-								
Montipora elschneri	3	26.7	7.6	20-35	2	33.0	14.9	22.4-43.5	2	11.6	0.6	11.2-12				
Montipora foveolata	1	30.4	-	-	2	57.8	38.3	30.7-84.9								
Montipora hoffmeister					1	35.0	-	-	4	19.3	6.8	12-28.3				

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Montipora sinensis	1	25.7	-	-												
Montipora socialis	1	100.0	-	-	2	37.5	21.8	22-52.9								
Montipora tuberculosa									6	9.9	4.1	3.9-16.1				
Montipora verrilli	4	14.3	5.9	8-22	7	14.4	9.0	6-30	17	9.6	6.7	1.7-23.3				
Montipora verrucosa					3	31.7	27.8	10-63								
Montipora (Tuberculate sp. 1)					2	22.5	3.5	20-25								
Montipora (Tuberculate sp. 2)					2	49.9	6.7	45-54.8								
Montipora (Foveolate sp. 1)					1	100.0	-	-								
Pavona clavus					2	18.0	0.0	18-18								
Pavona (P.) obtusata	2	12.9	2.6	11-14.7												
Pavona (P.) venosa					1	15.5	-	-								
Platygyra daedalea					3	18.5	6.9	14-26.4								
Platygyra pini					4	52.3	21.4	22-72	6	81.3	72.6	18-200				
Pocillopora damicornis	1	8.0	-	-	1	6.0	-	-								
Pocillopora danae	2	6.5	0.7	6-7	2	10.3	5.0	11-17								
Pocillopora elegans					2	33.0	0.0	33-33								
Pocillopora eydouxi	1	16.2	-	-	2	41.5	0.0	41.5-41.5								
Pocillopora meandrina	6	5.8	4.8	2-15												
Pocillopora setchelli	5	6.9	2.2	4-9.8	2	17.3	2.5	15.5-19								
Pocillopora verrucosa					2	27.3	4.6	22-30	1	30.0	-	-				
Pocillopora woodjonesi					1	28.0	-	-								
Pocillopora (Ramose sp. 1)					1	16.0	-	-								
Porites annae	1	6.0	-	-												
Porites australiensis					1	45.0	-	-								
Porites lobata	6	6.3	2.0	4.9-10					4	26.2	24.6	5.3-54.8				
Porites lutea	5	27.2	22.1	8-60	6	36.1	33.1	8-98.7	4	27.0	4.7	21.5-32.5				
Porites mordax					3	30.7	9.2	20-36								
Porites murrayensis					1	38.9	-	-								
Porites (S.) convexa	1	22.0	-	-	1	28.3	-	-	9	95.0	128.4	3-390				
Porites (S.) iwayamaensis	1	22.0	-	-												
Porites (S.) vaughani	4	6.0	0.8	5-7	6	4.7	1.5	2-6								
Psammocora contigua	7	6.6	6.3	2-20												
Stylocoeniella armata	3	2.3	0.6	2-3	1	4.0	-	-								
Stylophora mordax	3	8.3	2.1	6-10	4	18.5	10.7	8-30	5	12.2	6.8	3-20				
Turbinaria (Explanate sp. 1)					2	64.9	6.9	60-69.8								
TOTALS	121	11.8	12.2	2-100	147	31.7	29.5	2-200	87	27.3	53.3	1.7-390				

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Fouha Bay - Station S-1																
Pocillopora damicornis					5	6.4	3.0	3-10	3	5.3	1.2	4-6	2	2.5	0.7	2-3
Porites lutea	1	4.0	-	-	2	15.0	9.9	8-22	7	41.3	23.5	8-71				
Psammocora (Encrusting sp. 1)									1	44.3	-	-				
TOTALS	1	4.0	-	-	7	8.9	6.3	3-22	11	31.8	24.9	4-71	2	2.5	0.7	2-3
Fouha Bay - Station S-2																
Acanthastrea hillae					1	20.0	-	-								
Agariciella planulata					2	14.2	3.8	8-20.4								
Acropora nasuta	1	4.0	-	-												
Acropora wardii					1	3.0	-	-								
Cyphastrea serailia	3	12.7	8.5	4-21	1	12.0	-	-	1	18.0	-	-				
Echinopora lamellosa					1	22.0	-	-	1	16.0	-	-				
Euphyllia glabrescens					1	7.0	-	-								
Favia pallida	1	8.0	-	-	2	10.0	4.2	7-13								
Favia russelli					2	6.0	2.8	4-8								
Favites viren					1	27.0	-	-								
Goniastrea retiformis	4	12.0	5.6	7-19	2	7.5	4.9	4-11					3	10.3	7.8	4-19
Leptastrea purpurea	4	5.0	2.2	3-8					1	10.0	-	-	4	5.5	2.6	3-9
Leptoria phrygia	1	9.0	-	-												
Leptoseris incrustans					1	7.0	-	-	5	6.0	2.0	4-8				
Montipora acanthella									1	11.0	-	-				
Montipora elschneri					2	20.3	8.8	14.1-26.5								
Montipora hoffmeisteri					2	12.5	2.1	11-13.9	1	13.0	-	-				
Montipora tuberculosa					1	9.5	-	-	1	21.0	-	-				
Montipora verrilli	1	18.0	-	-	5	18.5	6.5	12-26.1	2	20.0	2.8	18-22	2	17.0	5.7	13-2
Montipora (Tuberculate sp. 1)									1	12.0	-	-				
Pavona divaricata									1	16.2	-	-				
Pavona (P.) obtusata					1	26.2	-	-	3	21.3	3.1	18-24				
Pavona (P.) venosa					3	52.1	29.5	32-86					1	71.2	-	-
Pocillopora damicornis					1	10.0	-	-	1	3.0	-	-	2	8.5	2.1	7-10
Porites australiensis									3	8.7	3.1	6-12				
Porites lobata					1	6.0	-	-					1	4.0	-	-
Porites lutea	13	23.7	22.0	8-93	6	30.1	36.3	4-78.8	8	53.8	75.0	5-200	5	23.2	27.9	4-70
Porites (S.) convexa					1	130.0	-	-								

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Porites (S.) horizontalata					1	25.3	-	-								
Porites (S.) moniticulosa									1	41.0	-	-				
Porites (S.) vaughani	1	3.0	-	-					1	5.0	-	-				
Psammocora contigua	2	3.5	0.7	3-4					1	4.0	-	-				
Psammocora (Encrusting sp. 1)					2	63.7	47.6	30-97.3	2	4.5	2.1	3-6				
Stylocoeniella armata													2	5.0	1.4	4-6
Stylophora mordax					2	19.5	19.1	6-33	2	11.0	9.9	4-18				
TOTALS	31	15.0	16.4	3-93	43	24.2	27.8	3-130	37	21.4	38.1	3-200	20	15.3	20.0	3-71.2
Fouha Bay - Station S-3																
Acanthastrea echinata	1	8.0	-	-	2	6.0	2.8	4-8								
Acanthastrea hillae					1	20.0	-	-								
Agariciella planulata					4	27.0	11.0	16-40								
Acropora humilis	2	10.0	2.8	8-12												
Acropora hystrix					1	6.0	-	-								
Acropora nasuta	1	13.0	-	-	1	8.0	-	-								
Acropora surculosa	2	7.0	1.4	6-8	3	9.3	3.1	6-12								
Acropora wardii																
Coscinaraca columna	1	32.5	-	-												
Cyphastrea serailia	1	14.0	-	-	1	8.0	-	-	1	20.8	-	-				
Echinophyllia aspera					1	13.0	-	-								
Echinopora lamellosa					1	41.5	-	-								
Euphyllia glabrescens	1	4.0	-	-												
Favia matthai	2	5.2	1.6	4-6.3												
Favia pallida	1	6.0	-	-	3	8.0	4.0	4-12								
Favia retumana					1	6.0	-	-								
Favites virens					1	27.0	-	-								
Galaxea fascicularis	1	6.0	-	-	1	8.0	-	-								
Goniastrea edwardsi	3	7.7	1.5	6-9	2	9.0	1.4	8-10								
Goniastrea retiformis	6	10.9	9.5	4-29.9	4	15.3	6.4	8-22								
Leptastrea purpurea	1	5.7	-	-	3	6.3	4.9	3-12								
Leptoseris transversa	1	27.3	-	-	1	41.0	-	-								
Leptoseris incrustans									2	5.0	1.4	4-6	1	8.0	-	-
Leptoseris mycetoseroides									1	37.9	-	-				
Leptoria phrygia	1	5.7	-	-												

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Millepora dichotoma	1	5.0	-	-	1	6.3	-	-								
Millepora foveolata					1	48.0	-	-								
Millepora platyphylla					1	61.0	-	-								
Montipora elschneri	1	22.0	-	-	1	40.5	-	-								
Montipora foveolata					3	24.7	7.0	18-42								
Montipora hoffmeisteri	1	18.0	-	-	1	24.0	-	-	5	29.7	11.2	18-45.5				
Montipora socialis									2	24.5	1.8	23.2-25.7				
Montipora tuberculosa					1	22.0	-	-	2	29.8	10.3	22.5-37				
Montipora verrilli	2	17.0	7.1	12-22	8	32.2	22.3	14-80	4	29.0	13.9	9.5-41.5				
Montipora (Papillate sp. 1)	1	14.0	-	-												
Montipora (Tuberculate sp. 1)									2	17.4	0.1	17.3-17.5				
Pavona minuta					1	120.0	-	-	3	50.7	33.9	20-87				
Pavona (P.) obtusata	1	32.0	-	-	2	24.5	12.0	16-33	10	7.2	3.0	3.7-12				
Pavona (P.) pollicata					1	11.0	-	-								
Pavona (P.) venosa	1	10.2	-	-					2	4.5	1.4	3.5-5.5				
Pavona (Explanate sp. 1)					2	160.7	27.3	141.4-180								
Platygyra daedalea					2	11.0	9.9	4-18								
Platygyra pini					1	13.5	-	-								
Pocillopora damicornis	1	6.0	-	-	4	8.0	2.2	6-11								
Pocillopora danae	1	9.0	-	-	3	9.0	2.6	7-12								
Pocillopora elegans									1	13.1	-	-				
Pocillopora meandrina					1	12.0	-	-								
Pocillopora setchelli					1	8.0	-	-								
Pocillopora woodjonesi					1	20.0	-	-								
Pocillopora (Ramose sp. 1)	1	7.0	-	-												
Porites australiensis	1	8.0	-	-												
Porites lobata	7	6.3	2.9	4-12	4	5.3	2.2	3-8								
Porites lutea	9	50.7	40.2	5-120	8	43.7	35.8	4-118	1	18.8	-	-				
Porites mordax	1	5.0	-	-	3	69.6	56.4	29.7-109.5								
Porites murrayensis					0	22.0	-	-								
Porites (S.) convexa					1	4.0	-	-	2	40.8	20.9	26-55.5				
Porites (S.) horizontalata									20	3.6	1.6	1.4-5.9				
Porites (S.) iwayamaensis	1	29.7	-	-	3	118	88.0	29-205								
Porites (S.) vaughani					1	5.5	-	-								
Psammocora contigua	3	6.3	3.8	2-8.9												
Psammocora (Encrusting sp. 1)					5	22.3	17.4	7-42.4								

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Stylocoeniella armata	1	4.0	-	-					2	3.7	0.3	3.5-3.9				
Stylophora mordax					1	13.0	-	-								
TOTALS	59	16.5	22.1	2-120	93	24.9	31.2	3-205	60	19.7	30.8	1.4-180	1	8.0	-	-
Fouha Bay - Station S-4																
Acanthastrea echinata			-	-	1	13.0	-	-								
Acropora humilis					1	4.0	-	-								
Acropora surculosa	2	6.9	1.6	5.7-8	1	8.0	-	-								
Acropora wardii	2	12.5	6.4	8-17	1	9.0	-	-								
Cyphastrea myriophthalma	1	9.4	-	-	1	4.0	-	-	1	5.9	-	-				
Cyphastrea serailia					2	6.0	2.8	4-8								
Diploastrea heliopora	1	42.0	-	-												
Echinophyllia aspera					1	11.0	-	-								
Echinopora lamellosa									1	12.0	-	-				
Favia favus	2	6.0	1.4	5-7												
Favia pallida	5	9.6	5.5	4-18	10	7.2	4.0	2-14	11	5.8	5.6	2-21.9				
Favia rotumana	1	7.0	-	-	1	12.0	-	-	1	4.0	-	-				
Favia russelli	1	4.9	-	-												
Favia stelligera	3	11.3	3.1	8-14	1	12.0	-	-								
Favites abdita	1	16.2	-	-												
Favites flexuosa	2	16.5	2.1	15-18												
Goniastrea edwardsi	1	8.0	-	-	4	10.5	7.3	4-21								
Goniastrea pectinata	1	8.0	-	-	1	12.0	-	-								
Goniastrea retiformis	3	7.0	1.0	6-8	1	13.5	9.4	7-30								
Goniopora columna					1	18.0	-	-								
Hydnophora microconos	1	12.0	-	-												
Leptastrea purpurea	1	4.0	-	-	3	9.3	11.0	2-22								
Leptastrea transversa	1	12.4	-	-	2	15.4	0.8	14.8-16	1	2.8	-	-				
Leptoria phrygia	1	22.0	-	-	1	16.0	-	-								
Leptoseris mycetoseroides									1	150.0	-	-				
Lobophyllia cerymbose	2	24.0	5.7	19.9-28	1	14.0	-	-								
Lobophyllia costata	1	120.0	-	-												
Lobophyllia hemprichii	1	37.2	-	-												
Millepora foveolata	2	90.2	108.7	13.3-167	2	35.2	3.1	33-37.4								
Millepora platyphyllia	2	7.5	2.1	6-8.9	1	17.7	-	-								

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Montastrea curta	1	8.2	-	-												
Montipora elschneri									4	11.6	4.1	6.7-16.2				
Montipora foveolata	2	8.9	1.3	.8-9.8	2	22.0	0.0	22-22								
Montipora hoffmeisteri	1	92.0	-	-	1	39.0	-	-	1	28.6	-	-				
Montipora tuberculosa	1	25.7	-	-	1	13.0	-	-								
Montipora verrilli	1	4.0	-	-	5	19.1	18.3	6-49.8	10	9.0	7.8	2.8-28.1				
Montipora verrucosa	1	7.0	-	-												
Montipora (Tuberculate sp. 1)					1	21.0	-	-	1	4.6	-	-				
Montipora (Tuberculate sp. 2)					1	71.0	-	-								
Pavona (P.) obtusata					1	26.3	-	-								
Pavona (P.) venosa					1	33.0	-	-								
Platygyra daedalea	4	38.2	54.7	6.9-120	5	14.4	7.1	6-21								
Platygyra pini					1	6.0	-	-								
Plesiastrea versipora									1	100.0	-	-	1	28.0	-	-
Pocillopora damicornis	1	6.0	-	-	1	8.0	-	-								
Pocillopora danae	1	6.4	-	-	1	6.0	-	-								
Pocillopora elegans	1	28.0	-	-												
Pocillopora ligulata					1	13.2	-	-								
Pocillopora meandrina					1	6.0	-	-								
Pocillopora verrucosa	2	17.5	6.4	13-22	1	24.8	-	-	1	23.5	-	-				
Pocillopora woodjonesi					2	18.8	0.8	18.2-19.3								
Pocillopora (Ramose sp. 1)	1	4.5	-	-												
Porites lobata	1	4.0	-	-	3	5.3	1.2	4-6								
Porites lutea	12	19.4	13.8	6-50.2	14	42.2	36.7	2-120	20	16.3	18.2	1-50.3				
Porites (S.) convexa					2	72.0	93.3	6-138								
Psammocora (Encrusting sp. 1)	1	8.5	-	-	1	20.8	-	-								
Stylocoeniella ormata									8	2.8	1.0	1.6-4.2				
Stylophora mordax	7	7.6	3.6	4-12	5	13.0	9.7	7-30								
Turbinaria (Explanate sp. 1)					1	65.0	-	-	1	14.4	-	-				
TOTALS	76	18.7	27.6	4-167	93	20.2	24.2	2-138	63	14.2	24.1	1-150	1	28.0	-	-

Table 25. Size distribution of coral species at Ylig Bay Stations N-1 through N-4 and S-1 through S-4

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Ylig Bay - Station N-1																
Montipora verrilli	No Corals Encountered								1	12.0	-	-	No Corals Encountered			
Pocillopora damicornis					1	6.0	-	-								
Porites lutea									2	6.0	2.8	4-8				
TOTALS					1	6.0	-	-	3	8.0	4.0	4-12				
Ylig Bay - Station N-2																
Acanthastrea echinata													1	14.0	-	-
Acropora kenti					4	23.3	4.6	18-29								
Acropora (Corymbose sp. 2)	1	12.0	-	-												
Echinophyllia aspera	1	3.0	-	-												
Echinopora lamellosa					1	31.0	-	-								
Favia favus													1	12.4	-	-
Favia pallida	1	7.7	-	-					3	8.4	4.0	6-13	1	6.0	-	-
Favia speciosa					2	15.9	8.3	10-21.8					1	3.0	-	-
Goniastrea edwardsi					1	6.3	-	-								
Goniastrea retiformis					3	24.4	5.9	19.6-31	3	19.6	4.9	14-23				
Hydnophora microconos					1	30.5	-	-								
Leptastrea immersa					1	25.0	-	-								
Leptastrea purpurea	4	13.6	3.2	9.8-16.9					5	8.0	4.2	3-12.2				
Leptoria phrygia					1	13.0	-	-								
Montipora hoffmeisteri					1	15.0	-	-								
Montipora lobulata					1	31.5	-	-	1	95.3	-	-	1	56.7	-	-
Montipora patula					1	14.1	-	-								
Montipora verrilli					1	41.0	-	-	1	95.5	-	-				
Montipora (Tuberculate sp. 1)									1	29.9	-	-				
Montipora (Tuberculate sp. 2)													1	18.9	-	-
Pavona divaricata													1	18.2	-	-
Pocillopora damicornis					3	18.8	12.2	5.7-29.9	12	7.0	4.3	2-14.7	1	19.5	-	-
Pocillopora danae	1	7.0														
Pocillopora eydouxi	1	41.0	-	-	1	2.0	-	-								
Pocillopora meandrina	1	18.2	-	-	1	9.2	-	-								
Pocillopora setchelli					2	17.0	2.8	15-19								

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Platygyra pini													1	22.0	-	-
Porites lutea	3	84.4	98.4	24.9-198	4	19.3	6.7	9.4-24.3	5	22.4	9.8	10-35				
TOTALS	13	30.5	51.4	3-198	29	20.4	9.4	2-41	31	17.2	22.4	2-95.5	9	19.0	15.5	3-56.7
Ylig Bay - Station N-3																
Acanthastrea echinata	1	15.8	-	-	1	15.8	-	-								
Acanthastrea hillae	-				1	122.0	-	-								
Acropora hystrix					1	8.2	-	-								
Acropora irregularis					2	12.0	7.8	6.5-17.5								
Acropora (Corymbose sp. 1)					2	14.9	12.9	24-5.7								
Acropora (Corymbose sp. 2)	1	19.0	-	-												
Agariciella planulata									1	31.4	-	-				
Alveopora (Explanate sp. 1)									1	27.0	-	-				
Astreopora myriophthalma					1	9.4	-	-	1	22.0	-	-				
Favia favus					1	6.9	-	-	1	7.7	-	-				
Favia pallida	3	10.0	3.5	6-12	3	7.4	2.6	5-10.2	3	17.1	12.1	6-30				
Favia speciosa	1	5.5	-	-	3	7.7	4.7	4-13	1	7.7	-	-				
Favites flexuosa					1	23.0	-	-								
Galaxea clavus									1	12.6	-	-				
Goniastrea edwardsi					3	13.1	3.0	10.6-16.5								
Goniastrea retiformis	3	23.8	15.3	6.9-36.7	6	9.7	5.8	4-18.8								
Goniopora tenuidens													1	6.0	-	-
Goniopora columna	1	16.0	-	-	1	44.2	-	-								
Hydnophora microconos					1	11.7	-	-								
Leptastrea purpurea	3	12.0	7.8	7-21	1	12.6	-	-	1	9.2	-	-				
Leptastrea transversa					1	10.2	-	-								
Leptoria phrygia					1	4.0	-	-								
Leptoseris hawaiiensis									1	7.3	-	-				
Millepora dichotoma	1	12.0	-	-					1	6.7	-	-				
Millepora elschneri					1	35.0	-	-								
Montipora hoffmeisteri					2	42.2	31.3	20-64.3	9	18.9	14.3	1.7-43.5				
Montipora patula					1	49.9	-	-								
Montipora sinensis					2	10.2	1.1	9.4-11								
Montipora verrilli	6	30.3	18.0	7.7-59	6	11.5	5.7	4-19.9	6	14.6	14.0	2.6-41.5				
Montipora verrucosa									1	9.2	-	-				

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Montipora (Papillate sp. 1)					2	9.2	4.0	6.3-12								
Montipora (Tuberculate sp. 1)									8	47.7	62.6	2.1-190				
Montipora (Tuberculate sp. 2)					1	164.9	-	-								
Pavona minuta									1	200.0	-	-				
Pavona (P.) obtusata					2	57.5	23.3	41-73.9	4	11.7	8.7	4.2-20.5				
Pavona (P.) venosa					3	125.5	151.2	37.4-300	1	46.9	-	-				
Pavona (Encrusting sp. 1)									1	120.0	-	-				
Pocillopora damicornis					5	9.7	3.7	5-14.9	1	10.2	-	-				
Pocillopora danae	1	9.1	-	-	2	40.4	7.6	35-45.7								
Pocillopora ligulata	1	20.0	-	-												
Pocillopora meandrina	2	15.7	1.8	14.4-17	2	6.9	1.6	5.7-8								
Pocillopora setchelli	1	14.0	-	-	5	12.4	5.1	8-21								
Porites lutea	3	45.1	3.8	40.9-48.3	1	23.7.0	-	-	4	41.4	60.0	3-129.6				
Porites superfusa	1	6.0	-	-												
Psammocora (Encrusting sp. 1)					2	49.2	11.5	41-57.3	11	5.0	3.7	1.2-12.1				
TOTALS	29	20.8	14.7	5.5-59	67	29.0	50.3	4-300	59	25.0	40.5	1.2-200	1	6.0	-	-
Ylig Bay - Station N-4																
Acanthastrea echinata					1	8.0	-	-								
Acropora humilis	1	11.2	-	-												
Acropora irregularis	1	30.5	-	-	1	5.0	-	-								
Acropora nana	1	8.9	-	-												
Acropora wardii	1	19.0	-	-	1	11.0	-	-								
Acropora (Corymbose sp. 1)	1	12.0	-	-												
Acropora surculosa	1	15.4	-	-												
Alveopora (Explanate sp. 1)									1	28.2	-	-				
Cyphastrea (Encrusting sp. 1)									1	8.4	-	-				
Echinophyllia aspera									1	10.2	-	-	1	12.0	-	-
Favia favus	1	7.0	-	-												
Favia matthai	1	11.0	-	-	2	11.0	4.2	8-14								
Favia pallida	3	6.7	1.1	6-8					2	11.5	0.7	11-12				
Favia rotumana					2	7.3	1.1	6.5-8	2	10.1	9.0	3.7-16.4				
Favia russelli	2	7.9	1.3	7-8.8	1	14.1	-	-								
Favia speciosa	3	14.5	6.5	7-18.4	1	18.4	-	-	2	8.0	4.9	4.5-11.4	1	4.0	-	-
Favia stelligera	1	12.2	-	-												

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Favites flexuosa	1	18.1	-	-												
Favites virens	1	11.0	-	-												
Galaxea fascicularis	1	8.2	-	-					1	13.3	-	-				
Goniastrea edwardsi	1	4.5	-	-												
Goniastrea pectinata					1	12.1	-	-								
Goniastrea retiformis	2	19.6	0.1	19.5-19.7												
Goniopora teniduens													2	17.5	10.7	9.9-25.1
Heliopora coerulea					1	53.0	-	-								
Hydnophora microconos					1	8.1	-	-								
Leptastrea purpurea	1	12.0	-	-					1	23.5	-	-	3	4.1	3.1	0.7-6.7
Leptastrea transversa									1	15.0	-	-				
Leptoria phrygia	1	28.0	-	-												
Leptoseris mycetoseroides					3	9.7	4.6	7-15								
Merulina ampliata	1	6.5	-	-					1	13.0	-	-				
Millepora dichotoma	1	8.1	-	-												
Millepora platyphylla	1	24.0	-	-												
Montastrea curta	1	6.5	-	-												
Montipora elschneri					1	28.1	-	-								
Montipora ehrenbergii					2	14.2	8.2	8.4-20								
Montipora hoffmeisteri					1	14.0	-	-								
Montipora lobulata					5	13.6	10.0	3.5-28.3	6	23.9	18.5	3.4-49.8	2	36.5	8.8	30.3-42.7
Montipora sinensis					1	50.0	-	-								
Montipora verrilli	8	18.6	11.4	3.4-31.9	7	25.3	19.6	9.8-56.8	12	21.4	14.1	2-43				
Montipora verrucosa					1	62.0	-	-					2	2.0	0.0	2-2
Montipora (Papillate sp. 1)	2	21.5	3.5	19-24												
Montipora (Glabrous sp. 1)	1	10.6	-	-												
Montipora (Foveolate sp. 1)					1	77.0	-	-								
Pavona minuta									1	107.0	-	-	4	160.1	179.5	63.2-429
Pavona (P.) obtusata									3	97.0	71.6	53.1-179.6	5	8.6	6.7	2.2-17.3
Pavona (P.) venosa					1	29.1	-	-								
Pavona (Foliaceous sp. 1)	1	8.1	-	-												
Platygyra daedalea					1	41.0	-	-								
Plerogyra sinuosa									3	13.6	8.3	8.7-23.2				
Pocillopora damicornis	1	6.0	-	-	1	4.0	-	-								
Pocillopora danae	2	11.5	12.0	3-20												
Pocillopora elegans					1	27.0	-	-								
Pocillopora eydouxi	1	41.0	-	-												

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Pocillopora ligulata	1	29.3	-	-		12.0		-								
Pocillopora meandrina	4	17.7	9.5	9-31	1	-	-									
Pocillopora setchelli	3	7.7	6.4	4-15	1	8.9	-	-								
Pocillopora verrucosa					1	21.0	-	-								
Pocillopora woodjonesi	1	28.0	-	-												
Pocillopora (Ramose sp. 1)	1	12.8	-	-												
Porites australiensis	10	66.6	63.2	6.3-190												
Porites lobata	1	9.0														
Porites lutea	8	10.2	4.5	4.9-19.4	13	25.4	35.2	6-134.2	1	45.0	-	-	1	33.0	-	-
Porites murrayensis									1	7.9	-	-				
Porites superfusa	3	4.3	1.5	3-6												
Porites (S.) *convexa*									1	40.2	-	-				
Porites (S.) *horizontalata*					1	27.1	-	-	1	21.9	-	-				
Porites (S.) *iwayamaensis*					3	37.4	49.0	8-94	1	120.0	-	-				
Porites (S.) *monticulosa*					1	154.9	-	-								
Porites (S.) *vaughani*					1	6.0	-	-								
Psammocora contigua	1	7.0	-	-												
Psammocora nierstraszi							-	-	4	78.9	74.1	11.8-145				
Psammocora (P.) *haimeana*					1	44.7	-	-					5	29.2	22.3	5.5-53.4
Psammocora (Encrusting sp. 1)	1	32.0	-	-	2	60.5	27.6	41-80	1	58.4	-	-				
Stylocoeniella armata	1	4.0	-	-	1	6.0	-	-		5.8	0.1	5.7-5.9	1	6.0	-	-
Stylophora mordax					1	12.0										
TOTALS	80	20.4	28.7	2.4-190	65	23.7	29.2	3.5-154.9	48	30.6	38.2	2-179.6	27	37.4	81.6	0.7-429
Ylig Bay - Station S-1																
Favia pallida					1	9.0	-	-					No Corals Encountered			
Goniastrea retiformis	1	8.0	-	-												
Leptastrea transversa					1	49.8	-	-								
Montipora verrilli					1	63.6	-	-								
Pocillopora damicornis					7	10.0	3.1	6-12								
Porites lutea					2	71.0	15.6	60-82	5	11.6	6.0	6-20				
TOTALS	1	8.0	-	-	12	28.0	27.8	6-82	4	11.5	6.0	6-20				

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Ylig Bay - Station S-2																
Acanthastrea echinata					1	8.4	-	-								
Acropora syringodes					1	8.0	-	-								
Acropora wardii					1	6.0	-	-								
Cyphastrea myriophthalma													1	14.3	-	-
Euphyllia (Ramose sp. 1)									1	10.0	-	-				
Favia favus					3	6.3	1.5	5-8	1	13.0	-	-	3	7.7	2.1	6-10
Favia pallida	1	5.0	-	-					3	12.3	3.1	9-15				
Favia speciosa					1	7.0	-	-								
Goniastrea edwardsi					2	6.0	2.8	4-8					1	7.8		
Goniastrea retiformis	1	20.2	-	-	1	8.0	-	-	2	8.1	5.7	4-12.1				
Hydnophora microconos													1	19.8	-	-
Leptoria phrygia					1	8.4	-	-								
Millepora foveolata					2	77.4	32.0	54.8-100								
Montipora caliculata													1	25.0	-	-
Montipora elschneri					1	36.7	-	-								
Montipora hoffmeisteri					2	26.5	26.2	8-45	2	48.1	45.3	16-80.1	1	14.0	-	-
Montipora lobulata					3	26.3	16.2	16-45	1	17.8	-	-	1	22.4	-	-
Montipora tuberculosa									1	49.0	-	-				
Montipora verrilli					2	27.9	5.4	24-31.7								
Montipora verrucosa													1	120.0	-	-
Montipora (Tuberculate sp. 1)									1	26.0	-	-	1	57.0	-	-
Montipora (Glabrous sp. 1)													1	12.2	-	-
Montipora (Papillate sp. 2)													1	84.8	-	-
Montipora (Tuberculate sp. 3)					1	70.0	-	-								
Pavona (P.) obtusata					1	22.0	-	-								
Pavona (P.) venosa													1	14.0	-	-
Platygyra daedalea									1	19.1	-	-				
Pocillopora damicornis	7	3.1	1.1	2-5	3	6.6	3.9	3.7-11	1	9.7	-	-				
Pocillopora meandrina													1	31.0	-	-
Porites annae	1	9.0	-	-												
Porites australiensis					1	21.0	-	-								
Porites lobata									1	9.0	-	-				
Porites lutea	2	27.0	18.4	14-40	2	42.0	39.6	14-70	4	28.4	12.3	10-35	2	18.5	12.0	10-27
Psammocora contigua	1	12.0	-	-	1	8.0	-	-								

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Psammocora (Encrusting sp. 1)					1	141.0	-	-	1	24.7	-	-				
Psammocora (Ramose sp. 1)	4	7.1	7.9	2.5-19	1	7.0	-	-								
TOTALS	17	8.9	10.0	2-40	32	25.9	31.5	4-141	20	22.1	17.9	4-80.1	17	28.4	31.1	6-120
Ylig Bay - Station S-3																
Acanthastrea echinata					3	11.7	7.4	6-20					No Corals Encountered			
Acropora hystrix					3	11.3	4.5	7-16	1	33.1	-	-				
Acropora irregularis	3	9.4	3.9	5-12.6												
Acropora palmerae					1	18.0	-	-								
Acropora surculosa					1	12.4	-	-								
Acropora wardii					1	8.0	-	-								
Alveopora (Explanate sp. 1)									1	36.3	-	-				
Cyphastrea serailia					1	8.0	-	-								
Favia favus					2	7.2	0.4	6.9-7.5	2	9.7	1.6	8.5-10.8				
Favia matthai									3	19.7	5.7	16-26.3				
Favia pallida					1	5.3	-	-	2	10.4	4.1	7.5-13.3				
Favia russelli					1	8.0	-	-								
Favia speciosa					2	13.0	5.7	8.9-17	2	13.2	5.6	9.2-17.1				
Favia stelligera					1	21.0	-	-	1	37.4	-	-				
Favites flexuosa									2	10.4	2.6	8.5-12.2				
Galaxea fascicularis	4	6.0	1.6	4-8	16	5.7	1.5	4-8								
Goniastrea edwardsi					3	14.9	2.3	12.2-16.4	5	11.3	6.4	3.5-21				
Goniastrea retiformis	3	21.8	16.6	7.5-40	10	32.5	17.8	10-59								
Hydnophora microconos									1	36.9	-	-				
Leptastrea purpurea					2	27.0	29.0	6.5-47.5	1	23.7	-	-				
Leptoria phrygia					1	17.8	10.3	8-26.5	4	15.7	10.7	3.4-27.9				
Montastrea curta					1	12.8	-	-								
Montipora hoffmeisteri									7	25.0	12.3	7.4-41.5				
Montipora lobulata					3	42.6	31.9	14.1-77								
Montipora patula					1	29.3	-	-								
Montipora tuberculosa									5	20.8	10.7	7-33				
Montipora verrilli					5	30.2	22.1	5-55.8	4	44.9	46.5	11-110.9				
Montipora verrucosa					1	22.0	-	-	2	32.5	34.3	8.2-56.7				
Montipora (Papillate sp. 2)					2	39.5	30.8	17.7-61.2								
Montipora (Tuberculate sp. 1)									1	28.4	-	-				

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Pavona varians					3	37.0	38.1	14-81								
Pavona (P.) obtusata					3	46.7	47.8	11-101								
Platygyra (P.) venosa					3	34.5	24.8	18.4-63								
Pavona (P.) (Encrusting sp. 1)	1	8.0	-	-												
Platygyra pini					1	26.5	-	-								
Pocillopora damicornis					2	3.7	2.9	2-7	1	6.0	-	-				
Pocillopora danae	1	2.0	-	-	1	4.0	-	-								
Pocillopora eydouxi					1	37.8	-	-								
Pocillopora meandrina					1	10.0	-	-								
Pocillopora setchelli					2	19.3	6.7	14.5-24								
Porites australiensis	2	14.0	8.5	8-20												
Porites lobata					1	6.4	-	-								
Porites lutea					3	54.0	68.7	8-133								
Stylocoeniella armata					1	9.0	-	-								
TOTALS	14	11.1	9.7	2-40	86	21.4	23.1	2-133	45	25.6	29.6	3.4-110.9				
Ylig Bay - Station S-4																
Acanthastrea echinata					3	4.3	4.1	1-8.8								
Acropora humilis	1	18.0	-	-												
Acropora hystrix					2	9.6	3.4	7.2-12								
Acropora irregularis	1	14.1	-	-	3	5.3	0.6	4.9-6								
Acropora nana	3	9.7	4.6	7-15	1	8.8	-	-								
Acropora nasuta	1	7.0	-	-												
Acropora palmerae	3	8.8	2.9	6.3-12												
Acropora surculosa	1	18.8	-	-	1	20.1	-	-								
Acropora valida	1	12.2	-	-												
Acropora wardii	1	6.0	-	-	1	6.0	-	-								
Acropora (Corymbose sp. 1)	1	14.0	-	-												
Acropora (Corymbose sp. 2)					1	15.0	-	-								
Alveopora (Explanate sp. 1)									3	14.4	9.9	4.9-24.7	5	19.2	14.2	5.1-35.1
Cyphyastrea serailia					1	6.7	-	-								
Diploastrea helioporia					1	41.0	-	-								
Distichopora (sp. 1)									2	1.5	0.7	1-2				
Echinophyllia aspera									1	11.0	-	-				
Favia favus	1	4.0	-	-	2	6.5	0.7	6-7								
Favia matthai									1	6.0	-	-				

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Favia pallida	1	11.0	-	-	1	12.1	-	-								
Favia rotumana					1	9.3	-	-								
Favia russelli					2	5.6	2.3	4-7.2								
Favia speciosa									1	12.4	-	-				
Favia stelligera					4	12.3	8.5	4-21	1	41.1	-	-				
Favites abdita	1	18.3	-	-												
Favites flexuosa					1	24.0	-	-								
Goniastrea edwardsi					3	14.6	9.2	4-21	4	19.8	4.9	15.3-26.8				
Goniastrea retiformis	4	24.4	6.1	17.9-30	9	15.4	5.4	4.9-23.8								
Goniopora tenvidens													3	15.0	7.8	6-20
Hydnophora microconos					1	12.9	-	-	1	46.9	-	-				
Leptastrea purpurea	1	11.0	-	-												
Leptastrea transversa					2	5.0	0.1	4.9-5								
Leptoria phrygia	5	22.3	8.9	11-31.7	2	18.4	4.4	15.3-21.5	1	9.0	-	-				
Leptoseris hawaiiensis					1	8.4	-	-								
Leptoseris incrustans									1	6.7	-	-				
Leptoseris (Explanate sp. 1)													1	7.2	-	-
Millepora dichotoma					1	7.3	-	-								
Millepora foveolata					2	69.0	39.6	41-97								
Millepora platyphylla	1	62.0	-	-												
Montastrea curta	1	6.4	-	-	1	12.7	-	-								
Montipora hoffmeisteri					1	101.0	-	-								
Montipora lobulata									20	17.6	12.2	5.2-52	6	21.9	19.0	5.7-57.2
Montipora verrilli					8	16.2	12.4	2-38.7								
Montipora verrucosa													1	10.1	-	-
Montipora (Papillate sp. 1)					1	25.7	-	-								
Montipora (Papillate sp. 2)					2	37.1	10.0	30-44.2								
Montipora (Tuberculate sp. 1)					1	28.5	-	-								
Pavona varians					12	21.5	20.0	3.4-60.8	8	31.6	29.5	4.8-93.4				
Pavona (P.) obtusata	1	22.4	-	-												
Pavona (P.) venosa					2	22.5	20.5	8-37	4	24.4	13.7	9.9-37.4				
Pavona (P.) (Encrusting sp. 1)					1	19.4	-	-								
Platygyra daedalea																
Platygyra pini									3	14.5	12.7	3.2-28.3				
Pocillopora brevicornis					1	9.2	-	-								
Pocillopora damicronis					1	4.8	-	-								
Pocillopora eydouxi					1	44.2	-	-								
Montastrea curata	1	6.4	-	-	1	12.7	-	-								

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w	n	$\bar{Y}$	s	w
Pocillopora meandrina					1	20.5	-	-	10	6.0	8.2	1-25.4				
Pocillopora setchelli	1	4.9	-	-	9	16.3	8.2	5-24.9	3	6.0	2.0	4-8				
Porites australiensis																
Porites lobota																
Porites lutea																
Porites murrayensis																
Porites superfusa	11	3.5	1.4	2-5	3	2.7	1.2	2-4	3	6.3	2.1	4-8				
Porites (S.) *convexa*					1	104.0	-	-								
Porites (S.) *horizontalata*									2	30.9	25.7	12.7-49	1	34.0	-	-
Porites (S.) *iwayamaensis*					1	36.0	-	-								
Porites (S.) *vaughan*	1	6.3	-	-	1	5.5	-	-								
Psammocora nierstraszi					1	81.0	-	-								
Psammocora digitata					1	40.6	-	-								
Psammocora (Encrusting sp. 1)	1	62.0	-	-												
Stylocoeniella armata	1	4.0	-	-					3	3.3	2.3	1.9-5.9				
Stylophora mordax	1	8.7	-	-												
TOTALS	45	13.6	13.4	2-62	96	19.3	20.4	1-104	72	16.7	16.0	1-93.4	17	19.0	14.3	5.7-57.2

Table 26. Frequency distribution of coral colony diameters at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

SIZE RANGE (cm)	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				TOTAL
	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	
0 - 5	2				3	2	3	3	47	15	21	8	22	14	19		1	2	1	2	7	5	9	6	13	9	20		10	13	29		286
5 - 10	1	1			1	3	5	4	25	16	16	11	55	23	24			4	3		8	10	9	8	23	26	13	1	30	27	14		361
10 - 15	1					2			19	16	7	3	20	17	10						4	8	4	1	7	13	3		13	19	6		173
15 - 20							1		10	13	4	3	8	10	9				1		6	3	6	1	1	11	5		9	5	3		109
20 - 25							4	1	4	5	2		7	14	5			1			3	3	4	1	4	8	4		3	9	2		84
25 - 30						1	3	1		8		1	3	12	5						1	6	1	1	3	3	4		3	3	2	1	62
30 - 35									3	6	1	2	2	8	2				1		1	2	1		4	4				2			39
35 - 40							1		1	3	3	2	1	10	1				1			1			1	4	4		1	3			37
40 - 45										2		1		7					1				1			6	2		2	2	2		26
45 - 50										4			1	5	1											1	1			3	2		18
50 - 55									2					5	2											1			1		1		12
55 - 60									1	3	3		1	5					2								1			1			17
60 - 65										1				2																1			4
65 - 70								2		2	2			2	3									1		1							13
70 - 75						1			1	2				2					1			1		1						1			10
75 - 80										2	1			1								1				1							6
80 - 85											1			2											1					1			5
85 - 90										1				1								1					1						4
90 - 95											1			1							1								1	1			5
95 - 100										5	2			4	1							1			1						1		15
Over 100									2	9	7	1	1	2	5							1	2		1	5	2		3	2	1		44
TOTAL	4	1	0	0	4	9	17	11	115	113	71	32	121	147	87	0	1	7	11	2	31	43	37	20	59	93	60	1	76	93	63	1	1330

Table 27. Frequency distribution of coral colony diameters at Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

SIZE RANGE (cm)	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				TOTAL
	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	
0 - 5			1		1	1	7	1		7	14		7	5	5	7			-		11	4	1		3	12	2		13	20	15		137
5 - 10		1	1		3	5	8	1	8	17	15	1	24	20	8	6	1	4	2		1	12	5	5	6	25	10		10	20	16	4	239
10 - 15			1		2	4	7	2	5	18	5		16	15	9	2		4	1		2	2	4	4	2	9	9		8	11	11	5	158
15 - 20					3	3	1	3	6	7	7		14	7	4	1					1	2	3	1	2	12	5		5	12	11	3	113
20 - 25					1	8	4	1	2	2	2		3	1	5				1		1	3	1	2		7	3		3	13	4		67
25 - 30						3	1		1		4		5	4	2	1							1	1		5	6		3	5	5	1	48
30 - 35					1	4	1		1	2	4		5		2	2						1	3	1			2		1	1	3	2	36
35 - 40									1	2				1	1	1					1	1			1	3	4			3	2	1	22
40 - 45					1	1			2	3	2		2	1	4	2						2				1	2			5	1		29
45 - 50									2	2	1			4	1			1					1			3					2		17
50 - 55														1	1	1						1				1					2		7
55 - 60								1	1	1				1	2									1		2	1			1		1	12
60 - 65										1						2		2								2			2	1			10
65 - 70																						2											2
70 - 75										1																							1
75 - 80														2												1							3
80 - 85											1					1		1					1	1		1				1			7
85 - 90																																	0
90 - 95													1	1																			2
95 - 100							2															1								1			4
Over 100					1					4	4		3	2	4	1						1		1		2	1			2			26
TOTAL	0	1	3	0	13	29	31	9	29	67	59	1	80	65	48	27	1	12	4	0	17	32	20	17	14	86	45	0	45	96	72	17	940

Table 28. Frequency distribution of coral colony growth forms at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

COLONY FORM	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				TOTAL
	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	
Arborescent										6	7		3	2											1	1							20
Cespitose						1		2	11	14	1	4	29	19	5			5	3	2	2		4	2	6	15	1		13	12	1		152
Corymbose	4					1			8	9			29	10	1						1	4			5	4			4	3	34		117
Massive					4	3	2	2	57	34	15	23	34	43	27		1	2	7		19	15	11	9	30	31	3		41	47	25	1	486
Encrusting						4	8	6	30	23	7	4	19	40	38				1		6	14	10	8	9	27	17		12	20			303
Columnar							2			11	23		6	6	16						3	3	4		5	6	23			6			114
Explanate Plates							2		2	12	18	1		5								6	7	1	1	7	16	1		3	3		85
Foliose		1					2			1													1										5
Flabellate Plates								1	2					2												1			2	1			9
Free (Fungiids)																																	0
Phaceloid							1		4	3			1	20								1		2	1				4	1			38
Solitary									1																								1
TOTAL	4	1	0	0	4	9	17	11	115	113	71	32	121	147	87	0	1	7	11	2	31	43	37	20	59	93	60	1	76	93	63	1	1330

Table 29. Frequency distribution of coral colony growth forms at Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

COLONY FORM	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				TOTAL
	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	
Arborescent					1				1	4	1		4	1	1										3				1	4	2		23
Cespitose		1			2	7	12	1	5	13	1		14	5	10			6			13	6	1	1		11			6	16	11		142
Corymbose					1	4			1	2			7	2	1							1			1	2			6	4			32
Massive			2		4	11	12	4	10	23	11	1	36	24	6	4	1	4	4		4	11	12	8	5	28	20		10	28	13	3	299
Encrusting			1		4	6	7	3	11	24	36		16	23	17	13		2				14	6	7	1	21	23		22	26	28	6	317
Columnar									1					4	3									1		3				2	1	1	16
Explanate Plates					1	1				1	9			5	4	10										6	2			14	16	7	76
Foliose								1					1		2															1	1		6
Flabellate Plates													1	1																1			3
Free (Fugniids)																																	0
Phaceloid											1		1		4								1		4	15							26
TOTAL	0	1	3	0	13	29	31	9	29	67	59	1	80	65	48	27	1	12	4	0	17	32	20	17	14	86	45	0	45	96	72	17	940

Discussion

As we moved along the river channel in the bay from the river mouth towards the open sea, there was a marked decrease in suspended sediment load and there was a marked increase in the complexity of the coral community. There was a six-fold (south side of the bay) to thirty-four-fold (north side of the bay) decrease in suspended sediment load between the first and fourth stations in Fouha Bay and a four-fold (north) to nine-fold (south) decrease in suspended sediment load between the first and fourth stations in Ylig Bay (Table 20). As we moved out of Fouha Bay to the fifth station, the suspended sediment load began to increase again (Table 20). This was possibly because heavier wave action on the open coast kept more materials in suspension.

As the suspended sediment load generally decreased along the shore-to-seaward gradient, the complexity of the coral community and the prevalence of corals generally increased. Between the first and fourth stations in both Fouha Bay and Ylig Bay, the numbers of coral species increased from less than ten to over one hundred (Table 21), the number of genera of corals increased from less than ten to thirty-five or over (Table 21), and the percent of the solid substrate occupied by corals increased from less than 2% to over 12% (Tables 22 and 23).

If the average suspended sediment load for 4.4 cm^2 over 6-week periods was in the range of 30 to 40 gms dry weight, then we would expect a depauperate coral community of less than 10 species covering less than 2% of the solid substrate to persist. If the average suspended sediment load was in the range of one to 6 gms dry weight, then we would expect a rich coral community of over 100 species covering over 12% of the solid substrate to develope. Suspended sediment loads with ranges between the above ranges would produce coral communities with intermediate species richness of corals and proportions of solid substrata occupied by corals.

Suspended sediment load is one of many factors that influence the structures of the coral communities in Fouha Bay and Ylig Bay. Water temperature, pH, salinity, nitrate content and phosphate content may influence the structures of coral communities on a larger scale of reference, but with the scope of this study in the two bays, these factors varied with time to such a large extent that the differences in magnitude of these factors between stations was generally negligible or confused.

When comparing the size distributions of the coral populations at the different stations, we find the third stations to have the most evenly proportioned size distributions (Tables 26 and 27). This suggests that recruitment and mortality may be relatively regular and therefore the populations of corals may be relatively stable at the third stations. At the other stations, there are relatively more corals in the small size classes and relatively few in the large size classes. This suggests that even if recruitment is greater, the mortality is also greater. Even the

fourth stations appear to have a higher rate of turnover in the coral populations than do the third stations. The relative evenness of distribution into size classes in the third stations suggests that both recruitment and mortality are relatively less sporadic than at other stations.

A similar examination of size distribution of the coral populations between the margins, the upper slopes, the lower slopes and the floors reveals that the coral populations on the slopes have the most even age distributions (Tables 26 and 27). The upper slope populations appear to have relatively steady recruitment with the greatest survival of juveniles to adulthood and old age. The lower slope populations are also relatively stable, but there appears to be more turnover, i.e., there is relatively more recruitment and fewer corals in the larger size classes on the lower slope than on the upper slope. The populations on the reef margin appear to have a lot of recruitment, but also high mortality. The coral populations on the channel floor are very depauperate because of very low success of recruitment. This is probably mainly because of the accumulation of sediments on the channel floor which usually bury and smother settling planulae and juvenile corals.

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