

PORTOMAREA MARINE MONITORING

CORAL AND FISH/INVERTEBRATE SURVEY

by

Marjo van den Bulck

July 2005

PORTOMAREA MARINE MONITORING

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PORTOMAREA MARINE MONITORING

FISH/INVERTEBRATE AND CORAL SURVEY OVERVIEW

Survey dates: June 26 - July 15, 2005.

Data observed and recorded by: Marjo van den Bulck

During 2005 there will be two monitoring periods. These periods will be in January and in July.

This was advised by Mr. Paul Hoetjes after reviewing the data collected in 2002. Mr. Paul Hoetjes is the senior scientist of the Netherlands Antilles Coral Reef Initiative (NACRI) and the Ministry of Health and Social Development in the Department of Environment and Nature (MINA).

WATER TEMPERATURE & VISIBILITY

Water temperature: 26C during the first half of this monitoring period. Second half of this monitoring period the temperature went up to 27C

Visibility varied from 10m to 40m. Average visibility 20m.

This monitoring period strange currents (17/1,19/1,20/1) occurred in the bay and on the outer second reef. When those currents occurred, visibility dropped to 10 meter or less.

TRANSECTS

Three (3) transect lines 95m long were set up for the coral line and fish/invertebrate belt surveys. Each line was divided into four 20m sections with 5m intervals, in accordance with accepted monitoring practices. Transect numbers 1 and 2 are on the west side of the bay at depths of 12m and 6m respectively. Transect 3 is on the east side of the bay at 10m.

Coral monitoring was carried out over each 20m section with sampling points at .5m intervals.

Fish/invertebrate monitoring was done over a contiguous 5m-wide 'belt' along 20m sections of the above described transect lines.

Detailed transect setup information can be found in the PortoMarea Marine Monitoring Manual.

No rebar replacement, five blue tags renewed.

CORAL MONITORING

Health

The overall general condition of the reef reflects the damage sustained in 1999 from Hurricane Lenny. Large boulder corals were overturned, and the corals subsequently died off.

Curacao was struck by hurricane Ivan september 9th 2004. This resulted in damage of the shallow water parts of the reef and a sand layer on the outer side of the second reef.

Transects 1 and 2, on the west side of the bay exhibit regeneration, e.g. new maze and mustard hill corals have begun to grow on the old dead coral boulders.

Transect 2 is basically a shallow patch reef with a high percentage of sand cover between coral patches.

Damage

Signs of recent damage, e.g. broken hard and soft corals were recorded during this monitoring period. Caused by Hurricane Ivan september 2004.

FISH/INVERTEBRATE SURVEY

There are fluctuations in the Fish/Invertebrate population on the transects. For details, check page 22 of this Survey report.

REEF BALL CLUSTERS

There are 2 snorkel trails laid out, consisting of 10 reef ball clusters on the west side of the bay at depths ranging from 1.2 to 3.8m, and 12 clusters on the east side of the bay at depths from 1.5 to 4.3m.

On April 6, 2002, 6 additional reef ball clusters (approximately 100 balls) were placed on the east side of the bay along the top edge of the inner reef, at an average depth of 4.3m. This brings the total number of clusters to 18.

All the Reef Balls show new coral growth. First spontaneous soft coral growth on the Reef balls reported.

Hurricane Ivan struck the 9th of September 2004. Most of the Reef balls within the Cluster formations moved a little because of Ivan. Four Reef balls broke into parts because they were slammed against another Reef Ball.

A lot of sand movement took place because of Ivan, Cluster 1W, 2W and 3W disappeared half in the sand.

REEF BALL CLUSTERS CORAL PLUGS

On February 8, 2002, six (6) varied coral plugs, incorporating a new transplant method, were planted on Cluster 12E/L. Twenty-four (24) Staghorn coral plugs were planted on Cluster 12E/L on March 23, 2002. These new plugs have been included in the report.

Compared to the observations in the July 2002 survey period a number of plugs then considered dead where in fact still alive: 10R-23LP Finger coral, 10R-9P Finger coral, 10R-17P Leaf (lettuce), 10R-18LP Mustard Hill, 12L-2P Pencil.

One pencil coral plug, 12L-2P, overlooked in the number of original plugs has been added to the data.

One black sea rod plug, overlooked in the October 2002 survey has been added to the data.

The broken off staghorn pieces that were found at Cluster 10W/R are still alive and placed in a Reef ball.

On May 1, 2003, 21 varied coral plugs were planted on Cluster 18E/L. These coral plugs were made and placed in the water at the beginning of the project. They were then placed for the time being on a tray near Cluster 10W/R. The data collected from these plugs on Cluster 18E/L are added to this rapport as from July 2003.

All the staghorn plugs are growing fast. A percentage broke off and started filling the spaces between the Reef Balls. These new locations are mentioned in this report.

Hurricane Ivan struck on the 9th of September 2004. Damage was best visible in the shallow water parts. 99% of the staghorn plugs planted on the Reef balls broke off. Cluster 12 East: most of the staghorn parts landed in between the Reef Balls of this cluster and continue growing here. Cluster 10 West: 80% of the staghorn parts ended up somewhere on the reef. The remaining staghorn parts continue growing in between the Reef balls of this cluster. The other coral plugs were not affected.

The broken off Staghorn plugs are reported as GONE and will not be monitored from now on as separate plugs. This will be reflected in the report as an increased mortality rate compared to the previous monitoring period

REEF BALL CLUSTERS FISH/INVERTEBRATE SURVEY - OBSERVATIONS

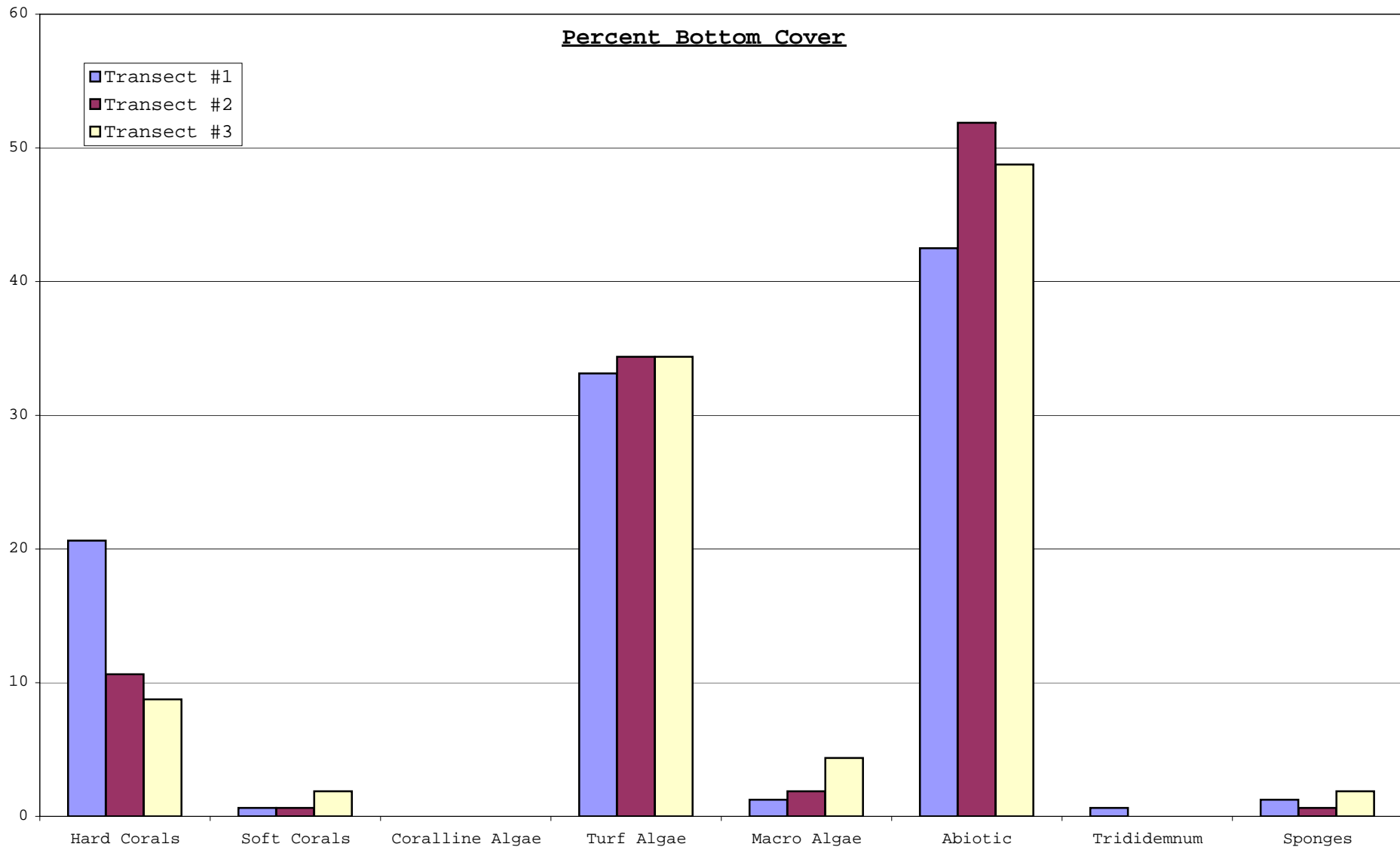
This report also shows an increased number of different species of Sea Urchins.

**PORTOMAREA MARINE MONITORING
CORAL LINE TRANSECT SUMMARY**

Date : July 2005
Observer: Marjo van den Bulck

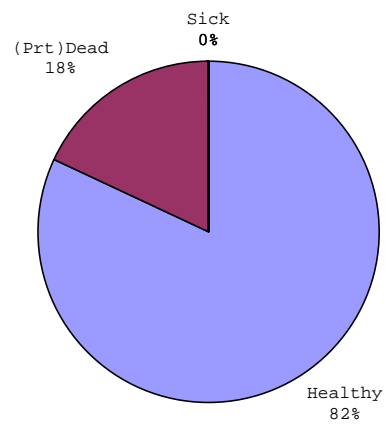
Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididemnum	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
1	12m														
	0-20m	11	9	2	0	0	0	0	0	14	0	14	1	0	40
	25-45m	12	12	0	0	0	0	0	0	12	1	14	0	1	40
	50-70m	5	3	2	0	0	0	1	0	14	0	20	0	0	40
	75-95m	5	3	2	0	0	0	0	0	13	1	20	0	1	40
	Mean	8	7	2	0	0	0	0	0	13	1	17	0	1	40
	% cover	21	82	18	0	0	0	1	0	33	1	43	1	1	100
	standard deviation	3.77	4.50	1.00	0.00	0.00	0.00	0.50	0.00	0.96	0.58	3.46	0.50	0.58	0.00
Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididemnum	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
2	6m														
	0-20m	2	2	0	0	0	0	0	0	9	1	28	0	0	40
	25-45m	2	2	0	0	0	0	0	0	19	1	18	0	0	40
	50-70m	9	5	4	0	0	0	0	0	9	0	22	0	0	40
	75-95m	4	3	0	1	0	0	1	0	18	1	15	0	1	40
	Mean	4	3	1	0	0	0	0	0	14	1	21	0	0	40
	% cover	11	71	24	6	0	0	1	0	34	2	52	0	1	100
	standard deviation	3.30	1.41	2.00	0.50	0.00	0.00	0.50	0.00	5.50	0.50	5.62	0.00	0.50	0.00
Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididemnum	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
3	10m														
	0-20m	8	6	2	0	0	0	0	0	10	1	20	0	1	40
	25-45m	2	2	0	0	0	0	2	0	11	0	24	0	1	40
	50-70m	1	1	0	0	0	0	1	0	12	2	23	0	1	40
	75-95m	3	3	0	0	0	0	0	0	22	4	11	0	0	40
	Mean	4	3	1	0	0	0	1	0	14	2	20	0	1	40
	% cover	9	86	14	0	0	0	2	0	34	4	49	0	2	100
	standard deviation	3.11	2.16	1.00	0.00	0.00	0.00	0.96	0.00	5.56	1.71	5.92	0.00	0.50	0.00

PORTOMAREA MARINE MONITORING
CORAL LINE TRANSECT SUMMARY

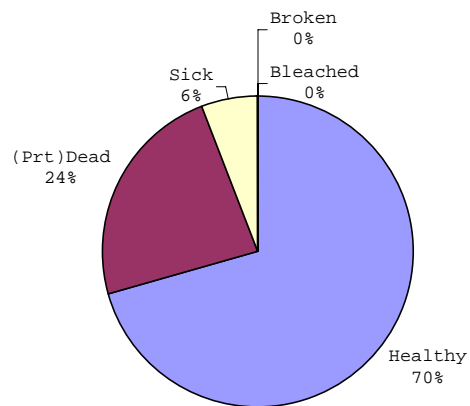


PORTOMAREA MARINE MONITORING
CORAL LINE TRANSECTS - CORAL HEALTH CHART

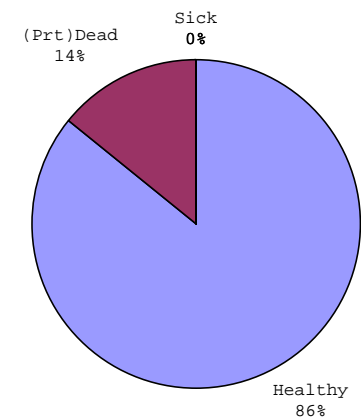
Transect 1, Depth 12m



Transect 2, Depth 6m



Transect 3, Depth 10m



PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 1, Depth 12m, Section 50-70m Visibility: 30 m Observer: Marjo van den Bulck
 Date: July 14, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER										
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics				
0.5																RB				
1															TA					
1.5															BA					
2																SD				
2.5			Boulder						Dead, partially 70%											
3																RB				
3.5			Boulder						Dead, partially 80%											
4															BA					
4.5																RB				
5															TA					
5.5																SD				
6															TA					
6.5															BA					
7																SD				
7.5																SD				
8																SD				
8.5																SD				
9																SD				
9.5																SD				
10																SD				
10.5				Brain					Healthy											
11			Boulder						Healthy											
11.5															TA					
12																RC				
12.5															TA					
13															TA					
13.5															BA					
14															BA					
14.5									Sea Plume	PU										
15															BA					
15.5																SD				
16															TA					
16.5																SD				
17		Mustard							Healthy											
17.5																SD				
18																SD				
18.5															TA					
19																SD				
19.5																SD				
20																SD				
Total	0	1	3	1	0	0	0	0	0	2	3	0	0	1	0	0	0	0	14	20

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 1, Depth 12m, Section 75-95m Visibility: 30 m Observer: Marjo van den Bulck
 Date: July 14, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER							
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics	
0.5																SD	
1																SD	
1.5																SD	
2																SD	
2.5															MTA		
3															YA		
3.5						Lettuce			Healthy								
4															TA		
4.5															BA		
5																SD	
5.5															TA		
6																RC	
6.5																SD	
7																RC	
7.5																SD	
8									Brown Sponge		BRO						
8.5																SD	
9																SD	
9.5						Lettuce			Dead, partially 60%								
10															TA		
10.5															BA		
11						Finger			Healthy								
11.5															TA		
12																SD	
12.5																RB	
13						Lettuce			Dead, partially 50%								
13.5															TA		
14															BA		
14.5															BA		
15															BA		
15.5																SD	
16																SD	
16.5																SD	
17																SD	
17.5															TA		
18															BA		
18.5																SD	
19																SD	
19.5																SD	
20						Finger			Healthy								
Total	0	0	0	0	2	3	0	0	2	3	0	0	0	1	13	20	

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	OR Orange
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 2, Depth 6m, Section 0-20m		Visibility: 20 m		Observer: Marjo van den Bulck																	
Date: July 7, 2005		Temperature: 27C																			
HARD CORALS									CONDITION/REMARKS				SOFT CORALS/OTHER								
M	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics					
0.5																	TA				
1																	RB				
1.5																	RB				
2																	RB				
2.5																	TA				
3			Smooth						Healthy												
3.5														MTA							
4																	TA				
4.5																	TA				
5																		RC			
5.5																		RB			
6																	TA				
6.5																	YA				
7																		SD			
7.5																		SD			
8																		SD			
8.5						Lettuce			Healthy												
9																	TA				
9.5																		SD			
10																		RB			
10.5																		SD			
11																		RC			
11.5																	TA				
12																		RB			
12.5																		RB			
13																		SD			
13.5																		RC			
14																	TA				
14.5																		SD			
15																		RB			
15.5																		RB			
16																		RB			
16.5																		SD			
17																		SD			
17.5																		SD			
18																		SD			
18.5																		SD			
19																		RC			
19.5																		RB			
20																		RB			
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	1	9	28					
	0	1	11	3	0	2	0	0	4	12	1	0		1	1	0	0	3	55	83	GRAND TOTAL

Substrate Codes:
 PD (Partially) Dead
 H Healthy
 S Sick
 BL Bleached

RC Rock
 RB Rubble
 SD Sand
 MA Macro Algae

YA Y Algae
 TA Turf Algae
 BA Blue Green Algae
 CA Coralline Algae
 TR Trididemnum

BRO Brown
 YE Yellow
 PU Purple
 BLA Black

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 2, Depth 6m, Section 25-45m Visibility: 20 m Observer: Marjo van den Bulck
 Date: July 7, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER							
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics	
0.5																RB	
1																SD	
1.5																TA	
2													MTA				
2.5																TA	
3																TA	
3.5																RB	
4																RB	
4.5																TA	
5																BA	
5.5																TA	
6																BA	
6.5																SD	
7																BA	
7.5																SD	
8																YA	
8.5																RB	
9		Mustard							Healthy								
9.5																SD	
10				Brain					Healthy								
10.5																YA	
11																YA	
11.5																TA	
12																SD	
12.5																TA	
13																RB	
13.5																RB	
14																BA	
14.5																YA	
15																SD	
15.5																RB	
16																RB	
16.5																SD	
17																TA	
17.5																TA	
18																TA	
18.5																BA	
19																SD	
19.5																SD	
20																RB	
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	19	18

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	BLA Black
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 2, Depth 6m, Section 50-70m Visibility: 20 m Observer: Marjo van den Bulck
 Date: July 7, 2005 Temperature: 27C

M	HARD CORALS							CONDITION/REMARKS	SOFT CORALS/OTHER								
	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics		
0.5															SD		
1															RB		
1.5															SD		
2															SD		
2.5					Lettuce			Healthy									
3																RC	
3.5		Boulder						Dead, partially 90%									
4															TA		
4.5																RB	
5																RC	
5.5																RC	
6															TA		
6.5																RC	
7															TA		
7.5																RB	
8																SD	
8.5																RC	
9																RB	
9.5															BA		
10																RC	
10.5		Boulder						Dead, partially 80%									
11		Boulder						Dead, partially 80%									
11.5		Boulder						Dead, partially 90%									
12															TA		
12.5																SD	
13																RB	
13.5																RB	
14		Boulder						Healthy									
14.5																RC	
15		Boulder						Healthy									
15.5																RC	
16		Smooth						Healthy									
16.5																RB	
17		Boulder						Healthy									
17.5																RB	
18															TA		
18.5															BA		
19															BA		
19.5															TA		
20																RB	
Total	0	0	8	0	0	1	0	0	4	5	0	0	0	0	0	9	22

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 2, Depth 6m, Section 75-95m Visibility: 20 m Observer: Marjo van den Bulck
 Date: July 7, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER										
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Googonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics				
0.5				Brain					Healthy											
1														TA						
1.5				Brain					Healthy											
2															RB					
2.5														RB						
3														YA						
3.5														YA						
4									Sea Plume	PU										
4.5														TA						
5														YA						
5.5															RB					
6														TA						
6.5									Yellow Sponge	YE										
7														TA						
7.5															RC					
8														TA						
8.5															RB					
9															SD					
9.5															RB					
10															RB					
10.5			Star						Healthy											
11														TA						
11.5														TA						
12															RB					
12.5														BA						
13															SD					
13.5														BA						
14														BA						
14.5														BA						
15													MTA							
15.5														TA						
16														TA						
16.5															RB					
17														TA						
17.5			Boulder						Sick											
18															RB					
18.5															SD					
19															RB					
19.5															RB					
20														TA						
Total	0	0	2	2	0	0	0	0	0	0	3	1	0	1	1	0	0	1	18	15

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	PU Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 3, Depth 10m, Section 0-20m		Visibility: 20 m		Observer: Marjo van den Bulck													
Date: July 4, 2005		Temperature: 27C															
M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER							
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics	
0.5																	RB
1																	RB
1.5																	TA
2																	RC
2.5																	TA
3																	YA
3.5																	RC
4													MTA				
4.5														TA			
5																	RB
5.5														TA			
6														TA			
6.5			Boulder						Healthy								
7														TA			
7.5														TA			
8																	SD
8.5																	SD
9																	RB
9.5														TA			
10																	RC
10.5		Mustard							Healthy								
11								Lettuce	Dead, partially 80%								
11.5								Lettuce	Dead, partially 80%								
12																TA	
12.5				Brain					Healthy								
13				Brain					Healthy								
13.5																	SD
14																	SD
14.5																	SD
15																	RB
15.5																	SD
16																	SD
16.5																	RB
17									Brown Sponge		BRO						
17.5			Boulder						Healthy								
18			Boulder						Healthy								
18.5																	SD
19																	SD
19.5																	SD
20																	SD
Total	0	1	3	2	0	2	0	0	0	2	6	0	0	0	1	10	20
	0	1	7	2	0	3	0	1	2	12	0	0	0	3	3	0	0

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	ENCR Encrusting
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 3, Depth 10m, Section 25-45m Visibility: 20 m Observer: Marjo van den Bulck
 Date: July 4, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER								
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics		
0.5																SD		
1						Lettuce			Healthy							SD		
1.5																SD		
2																RC		
2.5																SD		
3															TA			
3.5																RC		
4																SD		
4.5																SD		
5																SD		
5.5																BA		
6			Boulder						Healthy							YA		
6.5																SD		
7																SD		
7.5																SD		
8															TA			
8.5															TA			
9																SD		
9.5																SD		
10																SD		
10.5																SD		
11																SD		
11.5									Sea Plume	PU								
12									Sea Plume	PU								
12.5															TA			
13									Yellow Sponge	YE								
13.5																SD		
14																SD		
14.5																SD		
15																SD		
15.5																SD		
16																SD		
16.5															TA			
17																RB		
17.5															BA			
18															TA			
18.5															YA			
19															TA			
19.5																RB		
20																RB		
Total	0	0	1	0	0	1	0	0		0	2	0	0			0	11	24

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	WH White
		TR Trididemnum	ENCR Encrusting

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 3, Depth 10m, Section 50-70m Visibility: 15 m Observer: Marjo van den Bulck
 Date: July 5, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER											
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gorgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics					
0.5															RC						
1															BA						
1.5															TA						
2									Black Sponge		BLA				TA						
2.5																					
3																SD					
3.5																SD					
4																SD					
4.5																SD					
5																RC					
5.5														YA							
6																RC					
6.5														TA							
7														TA							
7.5																SD					
8																RB					
8.5														TA							
9																RB					
9.5														TA							
10																SD					
10.5																SD					
11																RB					
11.5																SD					
12									Sea Plume		PU										
12.5															TA						
13													MTA								
13.5																RC					
14																SD					
14.5														TA							
15													MTA								
15.5								Flower	Healthy												
16														TA							
16.5														TA							
17																RC					
17.5																SD					
18																SD					
18.5																RC					
19																SD					
19.5																SD					
20																SD					
Total	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	0	2	12	23

Substrate Codes:

PD	(Partially) Dead	RC	Rock	YA	Y Algae	BRO	Brown
H	Healthy	RB	Rubble	TA	Turf Algae	YE	Yellow
S	Sick	SD	Sand	BA	Blue Green Algae	PU	Purple
BL	Bleached	MA	Macro Algae	CA	Coralline Algae	OR	Orange
				TR	Trididemnum		

PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 3, Depth 10m, Section 75-95m Visibility: 15 m Observer: Marjo van den Bulck
 Date: July 5, 2005 Temperature: 27C

M	HARD CORALS								CONDITION/REMARKS	SOFT CORALS/OTHER							
	Branching	Mound	Star	Brain	Finger	Leaf	Fire Coral	Other Coral		Gozgonians	Sponges	Trididemnum	Coralline A	Macro Algae	Algae	Abiotics	
0.5															BA		
1																SD	
1.5																SD	
2															TA		
2.5																SD	
3															TA		
3.5																SD	
4															TA		
4.5															TA		
5															TA		
5.5													MTA				
6													MTA				
6.5													MTA				
7															TA		
7.5															TA		
8															TA		
8.5																SD	
9																SD	
9.5															TA		
10													MTA				
10.5															TA		
11																SD	
11.5															TA		
12															TA		
12.5																RB	
13															TA		
13.5															TA		
14																SD	
14.5															YA		
15				Boulder					Healthy								
15.5				Boulder					Healthy								
16																SD	
16.5				Boulder					Healthy								
17															TA		
17.5															TA		
18															TA		
18.5															TA		
19															TA		
19.5															BA		
20																RB	
Total	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	22	11

Substrate Codes:

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	BA Blue Green Algae	PU Purple
BL Bleached	MA Macro Algae	CA Coralline Algae	
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT SUMMARY: FISH and INVERTEBRATES

Jul-05

Data collected by: Marjo van den Bulck

PORTOMARI Atlantic Belt Transects		West side of Bay		East side	Total	Mean	St.Dev.
		Transect 1 Depth:12m	Transect 2 Depth: 6m	Transect 3 Depth:10m			
Fish							
ANGELFISH	Cherubfish	7	23	16	46	15.33	8.02
	French Angelfish	1		2	3	1.00	1.00
	Queen Angelfish	1			1	1.00	
	Rock Beauty			1	1	1.00	
BASSLET	Fairy Basslet	15		8	23	11.50	4.95
BLENNY	Redlip Blenny						
BOXFISH	Honeycomb Cowfish						
	Smooth Trunkfish		2		2	0.67	1.15
	Spotted Trunkfish						
BUTTERFLYFISH	Banded Butterflyfish		2	4	6	3.00	1.41
	Four-eye Butterflyfish	2	7		9	3.00	3.61
	Longsnout Butterflyfish			1	1	1.00	
CHROMIS	Blue Chromis	117	9	132	258	86.00	67.10
	Brown Chromis	395	325	775	1495	498.33	242.14
DAMSELFISH	Beaugregory Damselfish						
	Bicolor Damselfish	167	335	233	735	245.00	84.64
	Cocoa Damselfish		10	5	15	7.50	3.54
	Dusky Damselfish		17	13	30	15.00	2.83
	Sergeant Major						
	Threespot Damselfish	40	23	20	83	27.67	10.79
	Yellowtail Damselfish						
DRUM	Spotted Drum						
EEL	Goldentail Moray		1	4	5	2.50	2.12
	Sharptail Eel						
	Spotted Moray			3	3	1.00	1.73
FILEFISH	Orangespotted Filefish	1		2	3	1.00	1.00
	Whitespotted filefish						
FLOUNDER	Peacock Flounder						
GOATFISH	Spotted Goatfish						
	Yellow Goatfish	39	1	3	43	14.33	21.39
GOBY	Bridled Goby	65	47	75	187	62.33	14.19
	Neon Goby	1	1	4	6	2.00	1.73
	Peppermint Goby	16	32	60	108	36.00	22.27
	Coney		6	5	11	5.50	0.71
GROUPE	Graysby	12	5	10	27	9.00	3.61
	Rock Hind						
	Tiger Grouper						
	Bluestriped Grunt						
GRUNT	French Grunt	4	8	4	16	5.33	2.31
	Smallmouth Grunt	22	21	5	48	16.00	9.54
	Barred Hamlet	2		3	5	1.67	1.53
HAMLET	Black Hamlet						
	Butter Hamlet		1	1	2	0.67	0.58
	Yellowtail Hamlet	5	2	3	10	3.33	1.53
HOGFISH	Spanish Hogfish						
JACK	Bar Jack			1	1	0.33	0.58
MACKEREL	Cero						
PARROTFISH	Blue Parrotfish						
	Princess Parrotfish	27	14	26	67	22.33	7.23
	Queen Parrotfish	1			1	0.33	0.58
	Redband Parrotfish	5	5	3	13	4.33	1.15
	Stoplight Parrotfish	12	8	4	24	8.00	4.00
	Striped Parrotfish	3	1	6	10	3.33	2.52
PUFFER	Balloonfish						
	Sharpnose Puffer	10	8	7	25	8.33	1.53
RAY	Southern Stingray						
SCORPIONFISH	Spotted Scorpionfish			1	1	0.33	0.58
SEABASS	Creolefish						
	Harlequin Bass	3	10	7	20	6.67	3.51
SNAPPER	Tobaccofish						
	Grey Snapper						
	Schoolmaster			2	2	2.00	
SQUIRRELFISH	Red Snapper			2	2	2.00	
	Blackbar Soldierfish	1	5	8	14	4.67	3.51
	Squirrelfish	1	2	3	6	2.00	1.00
SURGEONFISH	Blue Tang	4	3	2	9	3.00	1.00
	Doctorfish		2	2	4	2.00	
	Ocean Surgeon						
	Bluehead Wrasse	37	51	23	111	37.00	14.00
WRASSE	Clown Wrasse	2	22		24	8.00	12.17
	Creole Wrasse	114		5	119	39.67	64.42
	Rainbow Wrasse						
	Slippery Dick						
	Yellowhead Wrasse	20	14	28	62	20.67	7.02
OTHERS	Cornetfish						
	Hawkfish, Redspotted						
	Sand Diver		1		1	0.50	0.71
	Sand Tilefish						
	Soapfish, Greater		2	1	3	1.00	1.00
	Trumpetfish	2		3	5	1.67	1.53
TOTAL		1154	1026	1526	3706	1235.33	
Invertebrates		Transect 1 Depth:12m	Transect 2 Depth: 6m	Transect 3 Depth:10m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone						
	Corkscrew Anemone	2	3	3	8	2.67	0.58
	Giant Anemone	4	13	14	31	10.33	5.51
	Knobby Anemone	30	7	24	61	20.33	11.93
TUBE WORMS	Christmas tree Worms	200	451	239	890	296.67	135.07
	Ghost Feather Duster						
	Magnificent Feather Duster	2	2		4	1.33	1.15
	Social Feather Duster		1	1	2	1.00	
	Split Crown Feather Duster	17	29	39	85	28.33	11.02
	Star Horseshoe Worm						
CRUSTACEANS	Variegated Feather Duster	26	3	11	40	13.33	11.68
	Banded Coral Shrimp	2			2	1.00	1.41
	Hairy Clinging Crab			1	1	1.00	
	Pederson Cleaner Shrimp	36	3	35	74	24.67	18.77
	Red Snapping Cleaner Shrimp			1	1	1.00	
MOLLUSKS	Yellowline Arrow Crab	2			2	2.00	
	Amber Pen Shell			1	1	1.00	
	Lettuce Sea Slug	2			2	2.00	
	Queen Conch			1	1	1.00	
ECHINODERMS	Rough File Clam		1		1	0.50	0.71
	Reef Urchin						
TOTAL		323	514	369	1206	402.00	

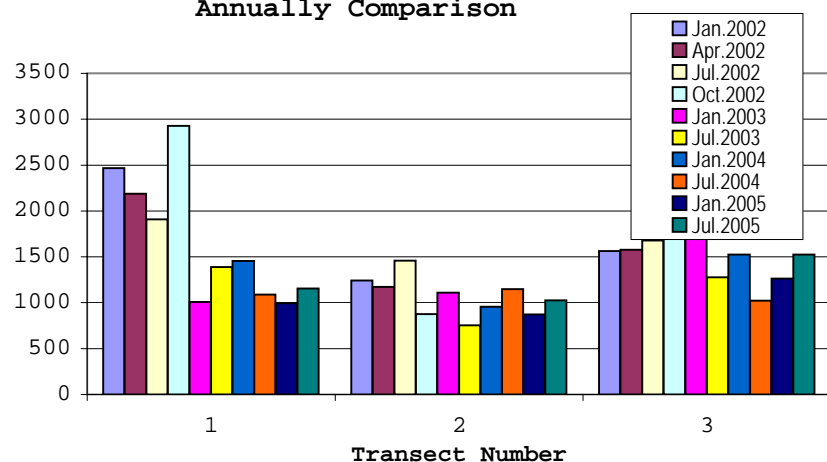
**PORTOMAREA MARINE MONITORING
FISH AND INVERTEBRATE QUARTERLY/SEMI-ANNUALLY COMPARISON**

	Transect 1 - Depth 12m				Transect 2 - Depth 6m				Transect 3 - Depth 10m			
	Jan.2002	Apr. 2002	July 2002	Oct. 2002	Jan.2002	Apr. 2002	July 2002	Oct. 2002	Jan. 2002	Apr. 2002	July 2002	Oct. 2002
Fish	2466	2187	1908	2929	1241	1173	1459	877	1562	1576	1677	1830
Invertebrates	556	384	314	406	537	596	724	731	432	334	403	187

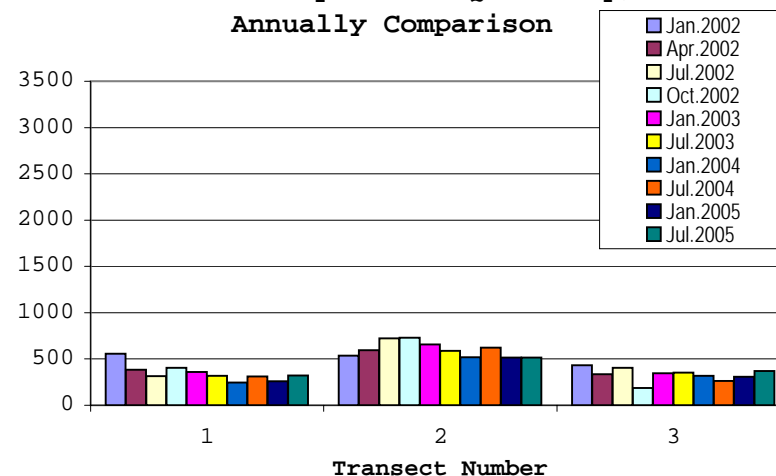
	Transect 1 - Depth 12m		Transect 2 - Depth 6m		Transect 3 - Depth 10m		Transect 1 - Depth 12m		Transect 2 - Depth 6m		Transect 3 - Depth 10m	
	Jan.2003	July 2003	Jan.2003	July 2003	Jan. 2003	July 2003	Jan.2004	July 2004	Jan.2004	July 2004	Jan. 2004	July 2004
Fish	1007	1390	1109	754	1767	1276	1454	1089	955	1149	1526	1024
Invertebrates	359	318	656	588	347	353	246	312	519	624	318	262

	Transect 1 - Depth 12m		Transect 2 - Depth 6m		Transect 3 - Depth 10m	
	Jan.2005	July 2005	Jan.2005	July 2005	Jan. 2005	July 2005
Fish	995	1154	873	1026	1262	1526
Invertebrates	260	323	515	514	307	369

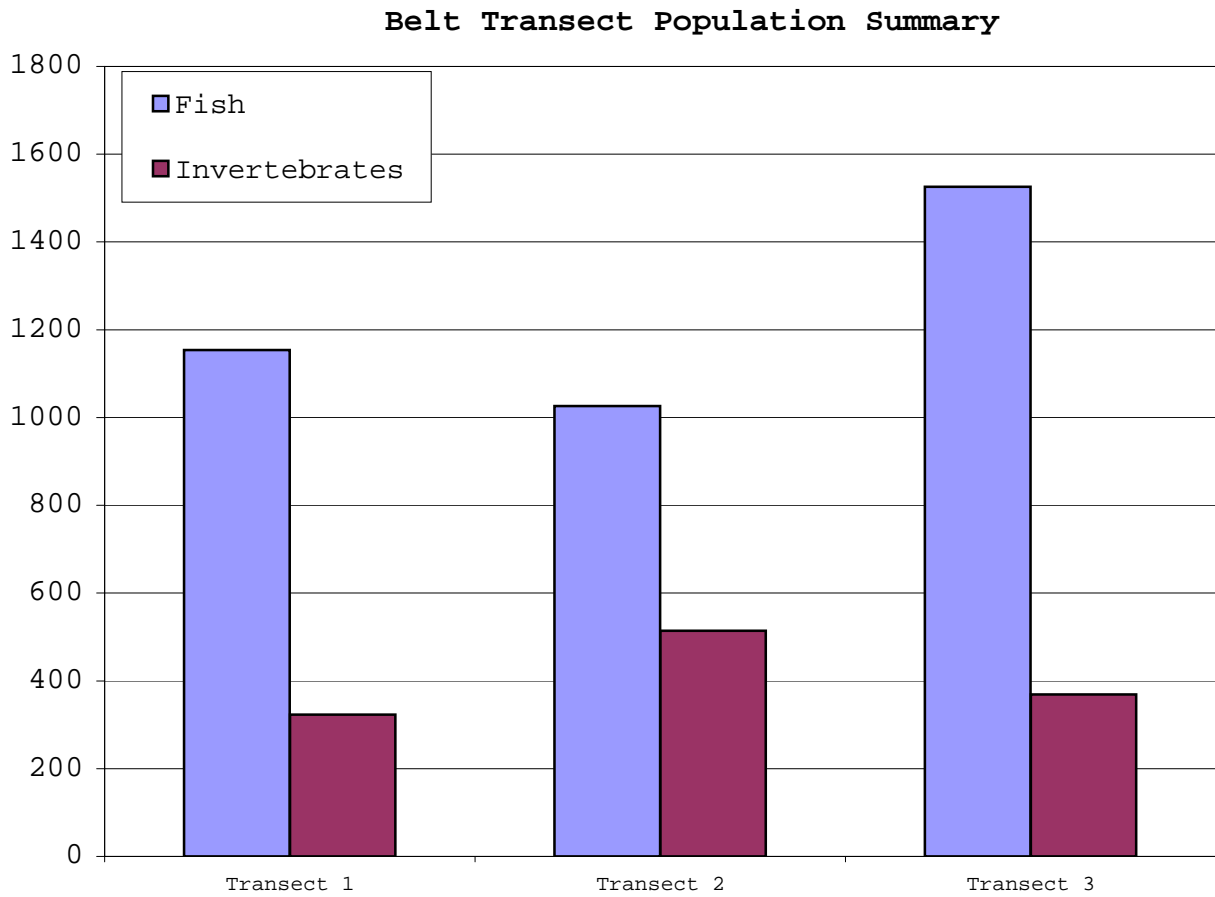
Fish Population Quarterly/Semi-Annually Comparison



Invertebrate Population Quarterly/Semi-Annually Comparison



PORTOMAREA MARINE MONITORING
ATLANTIC BELT TRANSECT FISH AND INVERTEBRATE SUMMARY



PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

Transect #1, Depth: 12m

Date: July 8/14, 2005

Data collected by: Marjo van den Bulck

Atlantic Belt Transect: Fish		0-20m	25-45m	50-70m	75-95m	Total	Mean	St.Dev.
ANGELFISH	Cherubfish	3	4			7	3.5	0.71
	French Angelfish	1				1	1	
	Rock Beauty			1		1	1	
BASSLET	Fairy Basslet	5	5	3	2	15	3.75	1.50
BLENNY								
BOXFISH	Smooth Trunkfish							
	Honeycomb Cowfish							
BUTTERFLYFISH	Banded Butterflyfish							
	Foureye Butterflyfish				2	2	2	
	Longsnout Butterflyfish							
CHROMIS	Blue Chromis	2	14	75	26	117	29.25	32.04
	Brown Chromis	75	50	200	70	395	98.75	68.36
DAMSELFISH	Bicolor	53	13	30	71	167	41.75	25.47
	Sergeant Major							
	Threespot	16	4	16	4	40	10.00	6.93
	Yellowtail							
DRUM	Spotted Drum							
EEL	Green Moray							
	Spotted Moray							
FILEFISH	Scrawled Filefish				1	1	1.00	
	Whitespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Yellow Goatfish	11		5	23	39	13	9.17
	Spotted Goatfish							
GOBY	Bridled Goby	22	9	16	18	65	16.25	5.44
	Neon Goby			1		1	1.00	
	Peppermint Goby	9	1	4	2	16	4	3.56
GROUPEL	Graysby	4	2	1	5	12	3.00	1.83
	Rock Hind							
GRUNT	Bluestriped Grunt							
	French Grunt	1		1	2	4	1.333333	0.58
	Smallmouth Grunt		1		21	22	11.00	14.14
HAMLET	Barred Hamlet	1	1			2	1	
	Butter Hamlet							
	Yellowtail Hamlet	1	1	1	2	5	1.25	0.50
HOGFISH	Spanish Hogfish							
JACK	Bar Jack							
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	8	5	6	8	27	6.75	1.50
	Queen Parrotfish			1		1	1	
	Redband Parrotfish	1	1	2	1	5	1.25	0.50
	Stoplight Parrotfish	1	2	2	7	12	3	2.71
PUFFER	Striped Parrotfish				3	3	3.00	
	Balloonfish							
	Sharpnose Puffer	4	4		2	10	3.333333	1.15
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish	1	1			2	1	
	Harlequin Bass	1		1	1	3	1	
SNAPPER	Gray Snapper							
	Red Snapper	1			6	7	3.5	3.54
SQUIRRELFISH	Blackbar Soldierfish				1	1	1.00	
	Squirrelfish				1	1	1	
SURGEONFISH	Blue Tang	1		2	1	4	1.333333	0.58
	Doctorfish							
	Ocean Surgeon				1	1	1	
WRASSE	Bluehead Wrasse	15	10	7	5	37	9.25	4.35
	Clown Wrasse			1	1	2	1	
	Creole Wrasse	100	13	1		114	38	54.03
	Slippery Dick							
OTHERS	Yellowhead Wrasse	4	4	2	10	20	5.00	3.46
	Sand Diver							
	Soapfish,greater							
TOTAL	Trumpetfish	1			1	2	1	
TOTAL		342	145	379	298	1164	291.00	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Corkscrew Anemone		1	1		2	1.00	
	Giant Anemone	1	1	2		4	1.33	0.58
	Knobby Anemone	9	11	7	3	30	7.5	3.42
TUBE WORMS	Christmas tree Worms	97	54	23	26	200	50.00	34.30
	Ghost Feather Duster							
	Magnificent Feather Duster		1		1	2	1.00	
	Split Crown Feather Duster	9	4	2	2	17	4.25	3.30
	Star Horseshoe Worm							
CRUSTACEANS	Variegated Feather Duster	3	3	13	7	26	6.50	4.73
	Banded Coral Shrimp	2				2	2	
MOLLUSKS	Pederson Cleaner Shrimp	5	6	12	13	36	9	4.08
	Yellowline Arrow Crab			1	1	2	1	
ECHINODERMS	Rough File Clam							
	Queen Conch		1			1	1	
TOTAL	Lettuce Sea Slug	1	1			2	1	
	Reef Urchin							
TOTAL		127	83	61	53	324	81	

Note: Previous observations (jan and april 2002) of Beaded Anemone are in fact Knobby Anemone.

PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

Transect #2, Depth: 6m
 Date: July 7, 2005
 Data collected by: Marjo van den Bulck

Atlantic Belt Transect: Fish		0-20m	25-45m	50-70m	75-95m	Total	Mean	St.Dev.
ANGELFISH	Cherubfish	6	13	3	1	23	5.75	5.25
	French Angelfish							
	Rock Beauty							
BASSLET								
BIGEYE								
BLENNY	Redlip Blenny							
BOXFISH	Smooth Trunkfish		1		1	2	1.00	
	Spotted Trunkfish							
BUTTERFLYFISH	Banded Butterflyfish		2			2	2.00	
	Foureye Butterflyfish	2	1	2	2	7	1.75	0.50
	Longsnout Butterflyfish			1	1	2	1.00	
CARDINALFISH								
CHROMIS	Blue Chromis	1	2		6	9	3.00	2.65
	Brown Chromis	75	100	75	75	325	81.25	12.50
DAMSELFISH	Bicolor Damselfish	104	113	54	64	335	83.75	29.10
	Cocoa Damselfish	3	1	3	3	10	2.50	1.00
	Dusky Damselfish	5	3	9		17	5.67	3.06
	Sergeant Major							
	Threespot Damselfish	2		13	8	23	7.67	5.51
YELLOWTAIL DAMSELFISH								
DRUM	Spotted Drum							
EEL	Goldentail Moray		1			1	1.00	
	Spotted Moray							
FILEFISH	Orangespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish			1		1	1.00	
	Yellow Goatfish		1			1	1.00	
GOBY	Bridled Goby	24	11	9	3	47	11.75	8.85
	Neon Goby	1				1	1.00	
	Peppermint Goby		4	20	8	32	10.67	8.33
GROUPE	Coney	1	4	1		6	2.00	1.73
	Grasby			3	2	5	2.50	0.71
GRUNT	Bluestriped Grunt							
	Ceasar Grunt	8				8	8.00	
	French Grunt	2	1	1	4	8	2.00	1.41
	Smallmouth Grunt				21	21	21.00	
HAMLET	Barred Hamlet							
	Butter Hamlet			1		1	1.00	
	Yellowtail Hamlet			1	1	2	1.00	
HOGFISH	Spanish Hogfish							
JACK	Bar Jack							
MACKEREL	Cero							
PARROTFISH	Princess Parrotfish	7	2	3	2	14	3.50	2.38
	Queen Parrotfish							
	Redband Parrotfish	2	1	1	1	5	1.25	0.50
	Stoplight Parrotfish	2	1	2	3	8	2.00	0.82
	Striped Parrotfish		1			1	1.00	
PUFFER	Balloonfish							
	Sharpnose Puffer	2		5	1	8	2.67	2.08
RAY								
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish							
	Harlequin Bass	3	4	1	2	10	2.50	1.29
	Tobaccofish							
SNAPPER	Schoolmaster	2			1	3	1.50	0.71
SQUIRRELFISH	Blackbar Soldier		1	2	2	5	1.67	0.58
	Squirrelfish	1	1			2	1.00	
SURGEONFISH	Blue Tang	3				3	3.00	
	Ocean Surgeonfish		1		1	2	1.00	
TRIGGERFISH	Black Durgon				1	1	1.00	
WRASSE	Bluehead Wrasse	22	3	8	18	51	12.75	8.77
	Clown Wrasse		1		21	22	11.00	14.14
	Creole Wrasse							
	Slippery Dick							
	Yellowhead Wrasse	4	7	2	1	14	3.50	2.65
OTHERS	Octopus					1	1.00	
	Lizardfish							
	Sand Diver			1		1	1.00	
	Sand Tilfish				2	2	2.00	
	Trumpetfish							
TOTAL		282	283	221	256	1042	260.50	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone							
	Corkscrew Anemone	2			1	3	1.50	0.71
	Giant Anemone		7	1	5	13	4.33	3.06
	Knobby Anemone	1	2	2	2	7	1.75	0.50
TUBE WORMS	Christmas tree Worms	175	33	152	91	451	112.75	63.90
	Ghost Feather Duster							
	Magnificent Feather Duster	1		1		2	1.00	
	Social Feather Duster	1				1	1.00	
	Split Crown Feather Duster	22		6	1	29	9.67	10.97
	Star Horseshoe Worm							
	Variegated Feather Duster	2	1			3	1.50	0.71
CRUSTACEANS	Banded Coral Shrimp							
	Pederson Cleaner Shrimp	1		2		3	1.50	0.71
	Yellowline Arrow Crab		1			1	1.00	
MOLLUSKS	Atlantic Thorny-oyster							
	Flamingo Tongue				1	1	1.00	
	Lettuce Sea Slug			1		1	1.00	
	Penn Shell							
	Queen Conch				1	1	1.00	
ECHINODERMS	Rough Fileclam							
	Reef Urchin							
TOTAL		205	44	165	102	515	129.00	

Note: Previous observations (jan and april 2002) of Beaded Anemone are in fact Knobby Anemone.

PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

Transect #3, Depth: 10m

Date: July 4, 2005

Data collected and recorded by: Marjo van den Bulck

Atlantic Belt Transect: Fish		0-20m	25-45m	50-70m	75-95m	Total	Mean	St.Dev.
ANGELFISH	Cherubfish		6	6	4	16	5.33	1.15
	French Angelfish	1	1			2	1.00	
	Queen Angelfish				1	1	1.00	
BARRACUDA								
BASSLET	Fairy Basslet	5		2	1	8	2.67	2.08
BIGEYE								
BLENNY								
BOXFISH	Honeycomb Cowfish							
	Smooth Trunkfish							
BUTTERFLYFISH	Foureye Butterflyfish							
	Banded Butterflyfish			3	1	4	2.00	1.41
	Longsnout Butterflyfish			1		1	1.00	
CHROMIS	Blue Chromis	75	25	10	22	132	33.00	28.74
	Brown Chromis	275	200	200	100	775	193.75	71.81
	Sunshinefish							
DAMSELFISH	Beaugregory Damselfish							
	Bicolor Damselfish	66	37	54	76	233	58.25	16.78
	Cocoa Damselfish			1	4	5	2.50	2.12
	Dusky Damselfish			5	8	13	6.50	2.12
	Sergeant Major							
	Threespot Damselfish	8	4	8		20	6.67	2.31
DRUM	Spotted Drum							
EEL	Goldentail Moray	1	1	1	1	4	1.00	
	Spotted Moray		1	1	1	3	1.00	
FILEFISH	Whitespotted Filefish		2			2	2.00	
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish		1	2		3	1.50	0.71
GOBY	Bridled Goby	13	31	29	2	75	18.75	13.77
	Neon Goby		2		2	4	2.00	
	Peppermint Goby	14	18	13	15	60	15.00	2.16
GROUPER	Coney			5		5	5.00	
	Graysby	4	2	2	2	10	2.50	1.00
	Rock Hind							
	Tiger Grouper							
GRUNT	Bluestriped Grunt							
	French Grunt	1	1	1	1	4	1.00	
	Smallmouth Grunt	2	1	1	1	5	1.25	0.50
HAMLET	Barred Hamlet	1	1	1		3	1.00	
	Black Hamlet							
	Butter Hamlet				1	1	1.00	
	Yellowtail Hamlet	1	1	1		3	1.00	
HOGFISH	Spanish Hogfish							
JACK	Bar Jack	1				1	1.00	
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	7	7	6	6	26	6.50	0.58
	Queen Parrotfish							
	Redband Parrotfish	1	1		1	3	1.00	
	Stoplight Parrotfish	3	1			4	2.00	1.41
PUFFER	Striped Parrotfish	2	2	2		6	2.00	
	Sharpnose Puffer	3	2	1	1	7	1.75	0.96
RAY	Southern Stingray							
SCORPIONFISH	Spotted Scorpionfish				1	1	1.00	
SEABASS	Creolefish							
SNAPPER	Harlequin Bass		1	3	3	7	2.33	1.15
	Schoolmaster	2				2	2.00	
SQUIRRELFISH	Gray Snapper		1	1		2	1.00	
	Blackbar Soldierfish	8				8	8.00	
SURGEONFISH	Squirrelfish	2			1	3	1.50	0.71
	Blue Tang	1		1		2	1.00	
	Doctorfish		1		1	2	1.00	
WRASSE	Ocean Surgeon							
	Bluehead Wrasse	8	3	3	9	23	5.75	3.20
	Clown Wrasse							
	Creole Wrasse	1	4			5	2.50	2.12
	Puddingwife							
	Slippery Dick							
OTHERS	Yellowhead Wrasse	9	8	9	2	28	7.00	3.37
	Soapfish	1				1	1.00	
TOTAL	Trumpetfish	1	2			3	1.50	0.71
		517	368	373	268	1526	381.5	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone							
	Corkscrew Anemone		1		2	3	1.50	0.71
	Giant Anemone	3	1	8	2	14	3.50	3.11
	Knobby Anemone	5	5	7	7	24	6.00	1.15
TUBE WORMS	Christmas tree Worm	59	40	67	73	239	59.75	14.36
	Ghost Feather Duster							
	Magnificent Feather Duster							
	Social Feather Duster				1	1	1.00	
	Split Crown Feather Duster	10	11	2	16	39	9.75	5.80
	Star Horseshoe Worm			1		1	1.00	
CRUSTACEANS	Variegated Feather Duster	1	6	3	1	11	2.75	2.36
	Yelloline Arrow Crab				1	1	1.00	
ECHINODERMS	Pederson Cleaner Shrimp	6	10	10	9	35	8.75	1.89
	Longspined Black Sea Urchin			1		1	1.00	
MOLLUSKS	Flamingo Tongue			1		1	1.00	
	Atlantic Thorny Oyster			1		1	1.00	
TOTAL	Lettuce Sea Slug	1				1	1.00	
		85	74	101	112	372	93	

Note: Previous observations (jan and april 2002) of Beaded Anemone are in fact Knobby Anemone.

PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SUMMARY-1a, WEST SIDE OF BAY

Date : July 6, 2005
Observer: Marjo van den Bulck

CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				position	height							
10 R	1 P	1	Leaf coral (lettuce)	NE	T	5	5,5	6	N	Y	Y	New coral growth on this ball
			Leaf coral (lettuce)	NW	M	GONE						Fire coral on this ball
			Leaf coral (lettuce)	N	M	GONE						
			Sea Rod, black	W	M	GONE						
			Sea Rod, purple	SE	H	GONE						
			Staghorn coral	W	T	GONE						
10 R	2 LP	1	Sea Rod, black	S	M	GONE, LYING IN THE SAND						New coral growth on this ball
			Star Coral, smooth	SW	H		5	8	N	Y	N	Fire coral on this ball
10R	3 P	1	Maze coral	NW	L	GONE						New coral growth on this ball
			Sea Rod, purple	W	T	GONE						
			Staghorn coral	NE	T	GONE						Fire coral on this ball
			Star coral	NE	H		6,5	12,5	N	N	N	
10 R	4 O	0	Finger coral	W	L	GONE						New coral growth on this ball.
			Staghorn coral		T	GONE						Staghorn with 14 growing tips in this Ball
10R	5 O	0	Sea Rod, purple	NE	H	GONE						New coral growth on this ball
			Sea Rod, white	NW	M	GONE						Algae on this ball
			Sea Rod, white	SW	H	GONE						
			Staghorn coral	S	M	GONE						
			Staghorn coral		T	GONE						Staghorn with 21 growing tips in this Ball
10R	6 LP	0	Sea Rod, purple	NE	M	GONE						New growth on this ball.
			Sea Rod, purple	SE	M	GONE						Fire coral on this ball
			Sea Rod, white	W	H	GONE						Algae on this ball
			Sea Rod, white	NW	M	GONE						
			Staghorn coral		T	GONE						
10R	7 O	0	No Plugs on this ball									New growth on this ball.
												Staghorn with 6 and 33 growing tips on Oster
10R	8 P	3	Leaf coral (lettuce)	NE	H	GONE						New coral growth on this ball
			Sea Rod, black	SE	H	GONE						Fire coral on this ball
			Sea Rod, black	SE	M	15	19,5	17	Y	Y	N	Position now SH
			Sea Rod, black	S	M	8	18	11	aching onto broken Reef Ball pa			Position now SWM, pointed downwards
			Sea Rod, white	E	H	> 150	24	45	Y	N	N	Position now SEH
			Staghorn coral	S	T	GONE						
			Staghorn coral	SW	T	GONE						P8 is broken in 3 parts after Ivan 9/2004
			Staghorn coral	W	T	GONE						
Subtotal			6 Number of live coral plugs									
Codes:												
CN	Cluster Number	U	Ultra Ball	T	Top of the ball							
B N/T	Ball number/type	P	Pallet Ball	H	Upper third of the ball							
LP	No. of live coral plugs	B	Bay Ball	M	Middle third of the ball							
		LP	LoPro Ball	L	Lower third of the ball							
		O	Oyster Ball									

PORTOMAREA MARINE MONITORING

REEF BALL CORAL PLUG SUMMARY-1b

CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				position	height							
10R	9 P	0	Finger coral	N	M-on oyster	GONE						New coral growth on this ball
			Finger coral	NW	M-on oyster	GONE						Fire coral on this ball
			Finger coral	NW	M	GONE						Staghorn with 7 growing tips on this Ba
			Flower coral	NE	T	GONE						
			Leaf coral (Lettuce)	NE	M	GONE						
			Sea Rod, Black	NE	M	GONE						
10 R	10 O	0	Finger coral	NE	M	GONE						No new coral growth.
10 R	11 LP	0	Staghorn	N	H	GONE	IVAN	Sep-04				No new coral growth on this ball
10 R	12 LP	1	Brain coral	NW	T		6	11	N	Y	Y	Dying? Algae seems to overgrow brain
			Flower coral	NE	H	GONE						No new coral growth on this ball.
			Flower coral	SE	L	GONE						
			Mustard hill coral	S	T	GONE						
10 R	13 B	0	Leaf coral (Lettuce)	N	M	GONE						New coral growth on this ball
			Sea Rod, Black	NW	H	GONE						Fire coral on this ball
			Sea Rod, Black	NW	M	GONE						Fire coral on plug base
			Staghorn	SW	H	GONE						Lying against Lo Pro 15
10 R	14 U	6	Brain coral	N	L		5,5	8	Y	N	N	New coral growth on this ball
			Finger coral	N	M	LYING IN THE SAND, 28 BRANCHES						Fire coral on this ball
			Leaf coral (Lettuce)	E	M	7	6,5	7	Y	Y	N	Fire coral on one part of this coral
			Leaf coral (Lettuce)	NW	L	4	5,5	8	Y	Y	N	
			Leaf coral (Lettuce)	NE	M	7	5,5	7	Y	Y	N	
			Leaf coral (Lettuce)	SE	M	1	5,5	8	Y	N	N	12o'clock
			Leaf coral (Lettuce)	SE	ML	GONE						Dying? Position SEML in stead of SSEML
			Leaf coral (Lettuce)	SSE	ML	3	4	7,5	Y	N	N	5 o'clock
			Leaf coral (Lettuce)	SSE	L	OVERGROWN BY FIRE CORAL						8 o'clock
			Leaf coral (Lettuce)	SE	M	GONE						
			Leaf coral (Lettuce)	SW	ML	GONE						Overgrown by Lumpy Overgrowing Sponge
			Leaf coral (Lettuce)	SW	M	GONE						
			Pencil coral	NE	M	GONE						
			Staghorn	S	H	GONE						
			Staghorn	N	H	GONE						
10R	15 LP	2	Brain coral	SW	T		6,5	8,5	Y	N	N	New coral growth on this ball
			Brain coral	SE	H		4	6	N	Y	Y	
10R	16 B	1	Brain coral	NW	H		3,5	9,5	Y	N	N	New coral growth on this ball
			Flower coral	NE	M	GONE						Fire coral on this ball
10R	17 P	0	Leaf coral (lettuce)	E	M	GONE						New coral growth on this ball
			Mustard Hill coral	NW	H	GONE						
			Pencil coral	NW	T	GONE						
10R	18 LP	0	Mustard hill coral	NE	H	GONE						No new coral growth on this ball
			Sea Rod, black	W	T	GONE						Oyster on sand now after Ivan 9/2004
			Sea Rod, purple	NW	M	GONE						Algae on this ball
Subtotal			10 Number of live coral plugs									

PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SUMMARY-1c

CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				position	height							
10R	19 O	0										No new growth, Algae
10R	20 O	0										No new growth, Algae
10R	21 O	0										No new growth, Algae
10R	22 LP	0										No new growth, Algae
10R	23 LP	2	Leaf coral (lettuce)	SE	H	GONE						New coral growth on this ball Fire coral on this ball This Ball moved, Ivan 9/2004
			Mustard hill	N	H	GONE						
			Sea rod, white	NW	H	49	21	15,5	Y	Y	N	
			Sea rod, white	NW	M	60	18	18	Y	Y	N	
			Finger coral	SW	H	GONE						
10R	24 P	1	Brain coral	NW	T	GONE						New coral growth on this ball Marine putty replugged Fire coral on this ball Found Broken off, placed on top of P 24
			Maze coral	SE	ML		3	9	Y	N	N	
			Mustard hill	NE	M	DEAD						
			Sea rod, black	NW	T	GONE						
			Sea rod, black	SW	T	GONE						
			Staghorn coral	N	T	GONE						
10R	25 B	1	Pencil coral	NW	M	3	0,5	1	N	N	N	2 Tips 0,5 by 0,5. Rest (80%) dead New coral growth. Fire coral on this ball
10R	26 LP	1	Maze coral	W	T		6	9,5	Y	Y	N	No new coral growth on this ball.
10R	27 B	1	Sea Rod, black	SW	T	GONE						New coral growth on this ball Fire coral on this ball
			Sea Rod, white	W	T	> 100	25	29	Y	Y	N	
10R	28 P	1	Finger coral	SW	H	GONE						New coral growth on this ball Fire coral on this ball Dying?
			Finger coral	NE	M	GONE						
			Flower coral	SE	H	GONE						
			Leaf coral (lettuce)	SW	M	2	4,5	7,5	COVERED IN ALGAE			
			Maze coral	W	M	GONE						
			Sea Rod, black	SE	T	GONE						
			Staghorn coral	W	H	GONE						
10R	29 O	0	Mustard hill	W	M	GONE						No new coral growth on this ball. Algae
10R	30 LP	0	Staghorn part in this									Algae on this ball
10R	31 O	0										
Subtotal		7										
Total		24 Number of live coral plugs										

PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SUMMARY - 2
EAST SIDE OF BAY

Date : July 1, 2005
Observer: Marjo van den Bulck

CN	B	N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
					direction	height							
12L	1P		4	Leaf coral (lettuce)	NW	T	4	11	14	N	N	Y/N	Top is covered in Algae. Two white area
				Pencil coral	NE	T	30	4	9	Y	N	N	4 growing tips left New coral growth on this ball. Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls
				Pencil coral	N	H	4	0,5	3	Y	N	N	
				Solitary Disk coral	N	L	DEAD						
				Staghorn coral	N	T	GONE						
				Staghorn coral	S	T	GONE						
				Staghorn coral	SW	T	150	38	61	N	Y	N	
				Staghorn coral	NW	H	GONE						
				Staghorn coral	SE	H	GONE						
12L	2P		3	Pencil coral	NE	T	1	0,5	0,5	N	N	N	Dying?
				Pencil coral	SW	T	DEAD						New coral growth on this ball
				Pencil coral	SE	H	33	4	6	Y	N	N	Xmas tree worm in this pencil coral
				Staghorn coral	NE	T	GONE						Ivan 9/2004. In between Reef Balls Broken off at base. Lying on top of Reef
				Staghorn coral	W	T	GONE						
				Staghorn coral	NW	T	100	35	57	N	N	N	
				Staghorn coral	NE	H	GONE						
				Staghorn coral	SE	H	GONE						
12L	3B		0	Finger coral	NW	T	GONE						New coral growth on this ball.
				Staghorn coral	SW	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	NE	H	GONE						Ivan 9/2004. In between Reef Balls
12L	4B		0	Staghorn coral	NE	H	GONE						New coral growth on this ball.
				Staghorn coral	SW	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	NW	H	GONE						
12L	5P		1	Finger coral	NE	T	1	0,5	3	N	N	N	Small living part
				Finger coral	NW	L	GONE						New coral growth on this ball. Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls Ivan 9/2004. In between Reef Balls
				Staghorn coral	SE	T	GONE						
				Staghorn coral	SW	T	GONE						
				Staghorn coral	NW	T	GONE						
				Staghorn coral	N	H	GONE						
				Staghorn coral	SE	H	GONE						
				Staghorn coral	NE	H	GONE						
				Staghorn coral	SW	H	GONE						
				Staghorn coral	WSW	H	GONE						
				Staghorn coral	NE	T	GONE						Ivan 9/2004. In between Reef Balls
Total				8 Number of live coral plugs									

PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SUMMARY - 3
EAST SIDE OF BAY

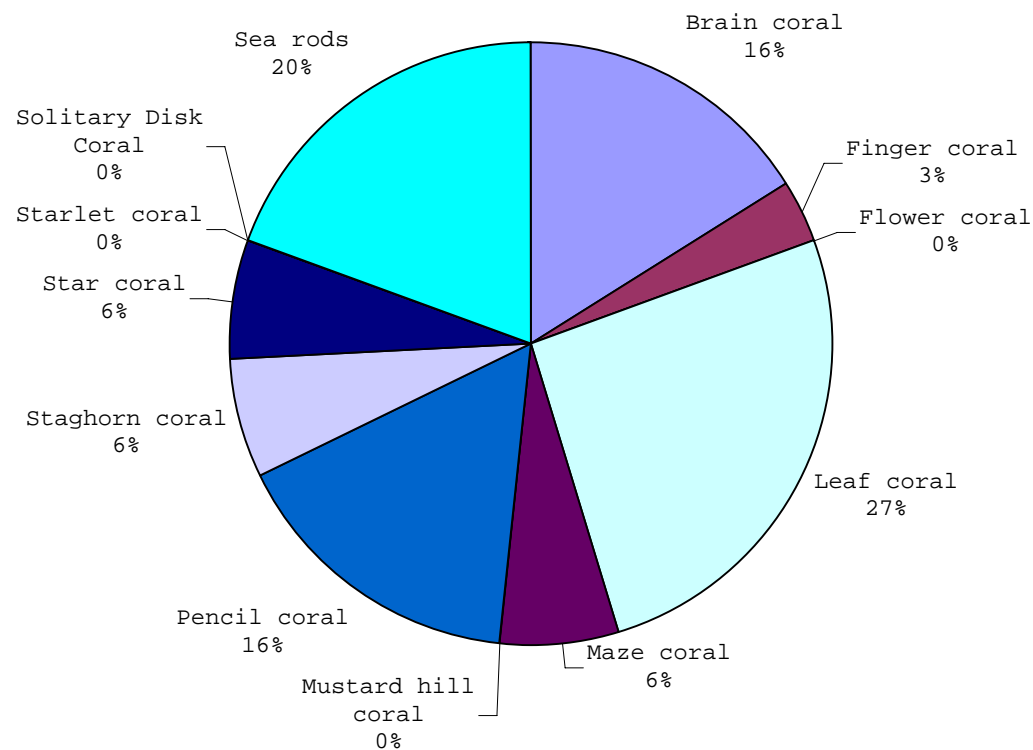
Date : July 1, 2005
Observer: Marjo van den Bulck

CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				direction	height							
18L	1LP	2	Sea Rod, black	N	T	13	23	26	Y	N	N	New coral growth on this ball.
			Pencil coral	SE	M	37	5,5	7	N	N	N	
18L	2B	2	Flower coral	W	T	32 cups	6	9,5	N	N	N	New coral growth on this ball. Alive only at the top
			Finger coral	SE	M	small tips	4	9,5	N	Y	N	
18L	3B	2	Sea Rod, black	SW	T	6	12	9	N	Y	N	New coral growth on this ball.
			Leaf coral (Lettuce)	W	H	3	0,5	2,5	Y	Y	N	
			Pencil coral	NE	H	GONE						
18L	4LP	2	Sea Rod, black	NE	T	6	15	12	N	Y	N	New coral growth on this ball.
			Pencil coral	SE	M	24	3	6	Y	N	N	
18L	5B	3	Star coral	SE	T		2,5	6,5	Y	N	N	New coral growth on this ball.
			Sea Rod, white	SW	H	250	32	34	Y	N	N	
			Leaf Coral (Lettuce)	NW	H	7	5,5	5,5	Y	N	N	
18L	6P	2	Leaf coral (Lettuce)	E	T	5	3,5	6	N	N	N	New coral growth on this ball.
			Star coral	SW	T		4,5	7	Y	N	N	
18L	7P	2	Maze coral	E	T		9	13	N	N	N	New coral growth on this ball.
			Star coral	W	T		6	8,5	Y	N	N	
			Finger coral	NW	T	GONE						
18L	8LP	0										
18L	9B	1	Star coral	NE	H		2,5	8	Y	N	N	New coral growth on this ball.
18L	10B	1	Finger coral	N	T	GONE						New coral growth on this ball.
			Pencil coral	E	H	8	4	5	Y	N	N	
			Leaf coral (Lettuce)	SW	H	GONE						
18L	11LP	0										
18L	120	0										
Total			17 Number of live coral plugs									

PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SPECIES SUMMARY

SPECIES DISTRIBUTION OF CORAL PLUGS ON REEF BALLS AS OF JULY 2005
CLUSTER 10 WEST/RIGHT, CLUSTER 12 EAST/LEFT

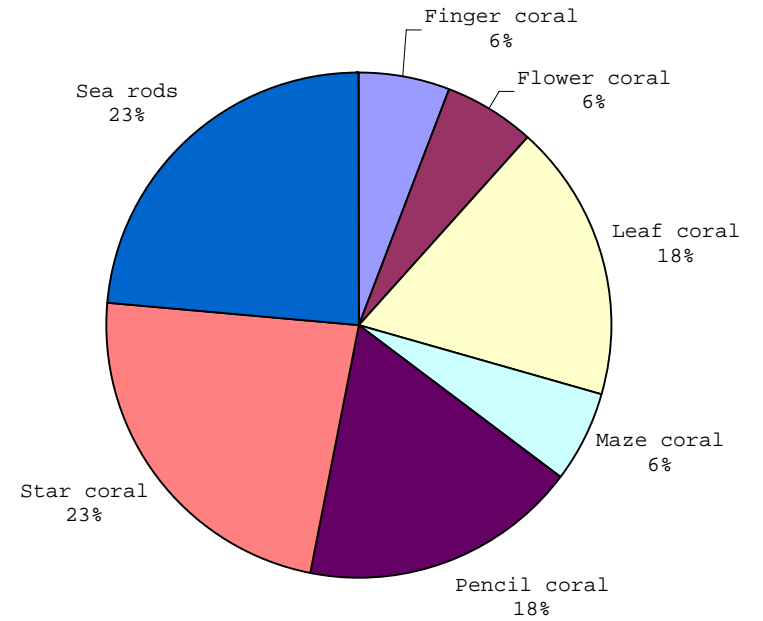
Coral Species	Number of Live Plugs	% of Total
Brain coral	5	16.13
Finger coral	1	3.23
Flower coral	0	0.00
Leaf coral	8	25.81
Maze coral	2	6.45
Mustard hill coral	0	0.00
Pencil coral	5	16.13
Staghorn coral	2	6.45
Star coral	2	6.45
Starlet coral	0	0.00
Solitary Disk Coral	0	0.00
Sea rods	6	19.35
black	2	
purple	0	
white	4	
TOTAL	31	100



PORTOMAREA MARINE MONITORING
REEF BALL CORAL PLUG SPECIES SUMMARY

SPECIES DISTRIBUTION OF CORAL PLUGS ON REEF BALLS AS OF JULY 2005
CLUSTER 18 EAST/LEFT

Coral Species	Number of Live Plugs		% of Total
Finger coral		1	5.88
Flower coral		1	5.88
Leaf coral		3	17.65
Maze coral		1	5.88
Pencil coral		3	17.65
Star coral		4	23.53
Sea rods		4	23.53
	black	3	
	white	1	
TOTAL		17	100

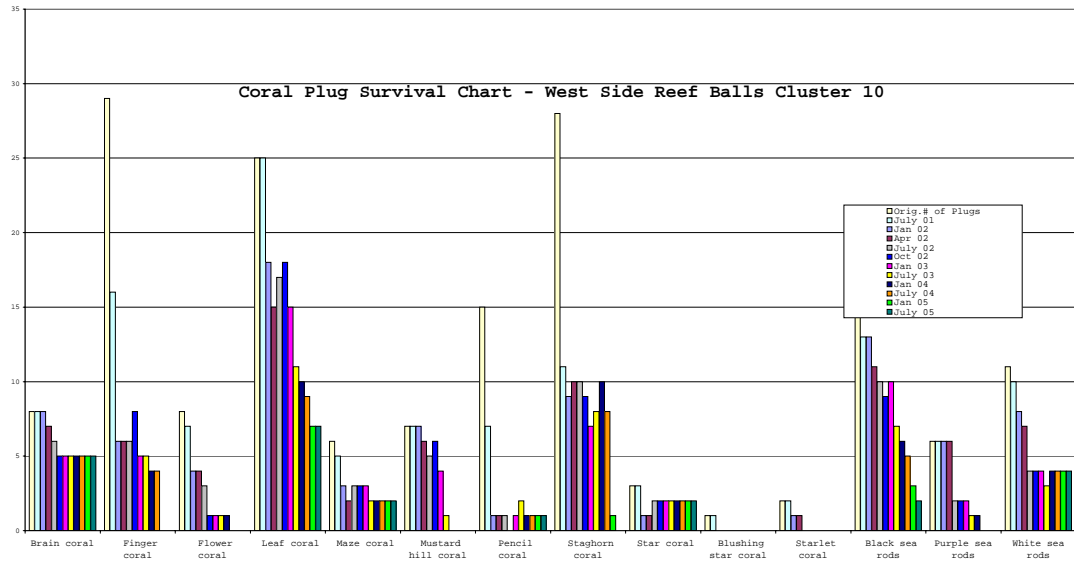


Coral Plug Survival Summary
West Side Reef Balls, Cluster 10

July 2001 Monitoring (per M.Kuunen)				January 2002 Monitoring		April 2002 Monitoring		July 2002 Monitoring		October 2002 Monitoring		January 2003 Monitoring		July 2003 Monitoring		January 2004 Monitoring		July 2004 Monitoring	
Coral Species	Orig.# of Plugs	Number of Live Plugs	Mortality 90 days	Number of Live Plugs	Mortality 9 months	Number of Live Plugs	Mortality 12 months	Number of Live Plugs	Mortality 15 months	Number of Live Plugs	Mortality 18 months	Number of Live Plugs	Mortality 21 months	Number of Live Plugs	Mortality 27 months	Number of Live Plugs	Mortality 33 months	Number of Live Plugs	Mortality 39 months
Brain coral*	8	8	0%	8	0%	7	13%	6	25%	5	38%	5	38%	5	38%	5	38%	5	38%
Finger coral	29	16	45%	6	79%	6	79%	6	79%	8	72%	5	83%	5	83%	4	86%	4	86%
Flower coral	8	7	13%	4	50%	4	50%	3	63%	1	88%	1	88%	1	88%	1	88%	0	100%
Leaf coral	25	25	0%	18	28%	15	40%	17	32%	18	28%	15	40%	11	56%	10	60%	9	64%
Maze coral	6	5	17%	3	50%	2	67%	3	50%	3	50%	3	50%	2	67%	2	67%	2	67%
Mustard hill coral*	7	7	0%	7	0%	6	14%	5	29%	6	14%	4	43%	1	86%	0	100%	0	100%
Pencil coral	15	7	53%	1	93%	1	93%	1	93%	0	100%	1	93%	2	87%	1	93%	1	93%
Staghorn coral	28	11	61%	9	68%	10	64%	10	64%	9	68%	7	75%	8	71%	10	64%	8	71%
Star coral	3	3	0%	1	67%	1	67%	2	33%	2	33%	2	33%	2	33%	2	33%	2	33%
Blushing star coral	1	1	0%	0	100%	0	100%	0	100%	0	100%	0	100%	0	100%	0	100%	0	100%
Starlet coral	2	2	0%	1	50%	1	50%	0	100%	0	100%	0	100%	0	100%	0	100%	0	100%
Sea rods black	15	13	13%	13	13%	11	27%	10	33%	9	40%	10	33%	7	53%	6	60%	5	67%
Sea rods purple	6	6	0%	6	0%	6	0%	2	67%	2	67%	2	67%	1	83%	1	83%	0	100%
Sea rods white	11	10	9%	8	27%	7	36%	4	64%	4	64%	4	64%	3	73%	4	64%	4	64%
TOTALS	164	121	26%	85	48%	77	53%	69	58%	67	59%	59	64%	48	71%	46	72%	40	76%

* Number of original plugs adjusted to correspond to Jan/02 survey

Coral Species	January 2005 Monitoring		July 2005 Monitoring	
	Number of Live Plugs	Mortality 45 months	Number of Live Plugs	Mortality 51 months
Brain coral*	5	38%	5	38%
Finger coral	0	100%	0	100%
Flower coral	0	100%	0	100%
Leaf coral	7	72%	7	72%
Maze coral	2	67%	2	67%
Mustard hill coral*	0	100%	0	100%
Pencil coral	1	93%	1	93%
Staghorn coral	1	96%	0	100%
Star coral	2	33%	2	33%
Blushing star coral	0	100%	0	100%
Starlet coral	0	100%	0	100%
Sea rods black	3	80%	2	87%
Sea rods purple	0	100%	0	100%
Sea rods white	4	64%	4	64%
TOTALS	25	85%	23	86%

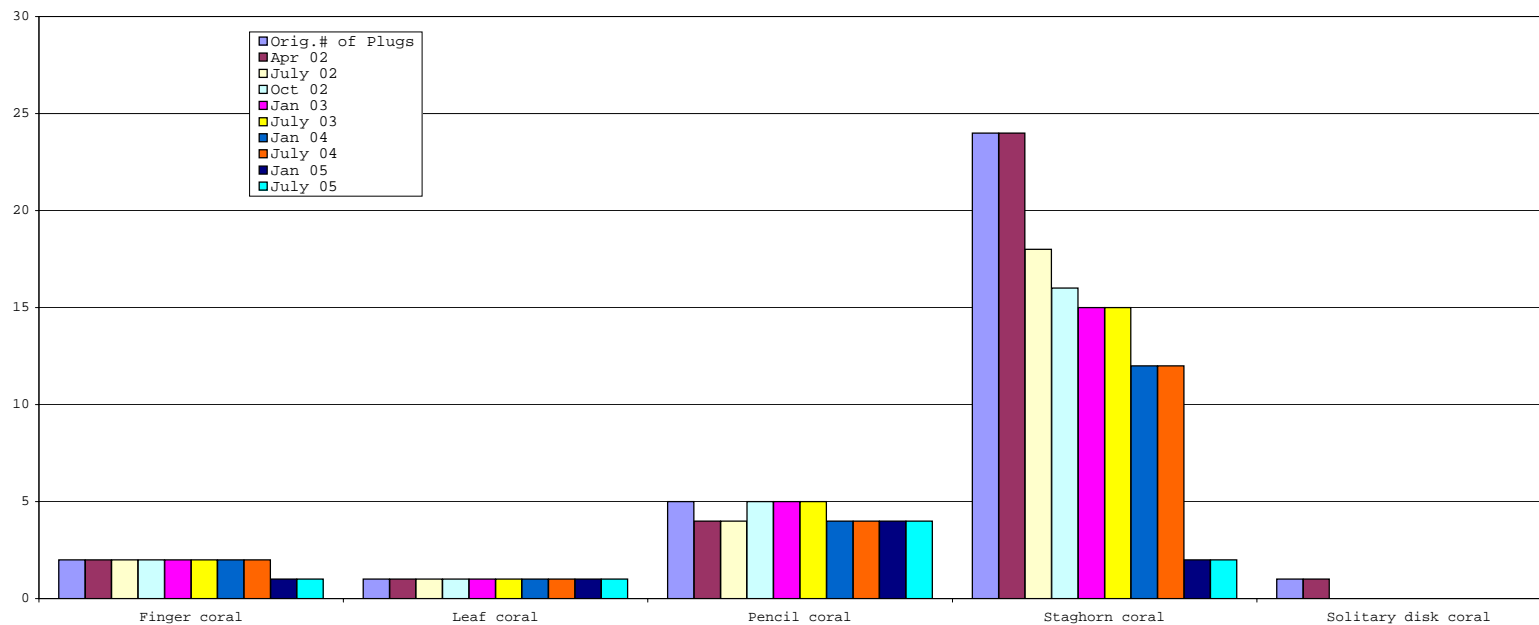


PORTOMAREA MARINE MONITORING
Coral Plug Survival Summary
East Side Reef Balls, Cluster 12

		April 2002 Monitoring		July 2002 Monitoring		October 2002 Monitoring		January 2003 Monitoring		July 2003 Monitoring	
Coral Species	Orig.# of Plugs	Number of Live Plugs	Mortality 15 days	Number of Live Plugs	Mortality 3.5 months	Number of Live Plugs	Mortality 6.5 months	Number of Live Plugs	Mortality 9.5 months	Number of Live Plugs	Mortality 15.5 months
Finger coral	2	2	0%	2	0%	2	0%	2	0%	2	0%
Leaf coral	1	1	0%	1	0%	1	0%	1	0%	1	0%
Pencil coral	5	4	20%	4	20%	5	0%	5	0%	5	0%
Staghorn coral	24	24	0%	18	25%	16	33%	15	38%	15	38%
Solitary disk coral	1	1	0%	0	100%	0	100%	0	100%	0	100%
		Mean		Mean		Mean		Mean		Mean	
TOTALS	33	32	3%	25	24%	24	27%	23	30%	23	30%

		January 2004 Monitoring		July 2004 Monitoring		January 2005 Monitoring		July 2005 Monitoring	
Coral Species	Orig.# of Plugs	Number of Live Plugs	Mortality 21.5 months	Number of Live Plugs	Mortality 27.5 months	Number of Live Plugs	Mortality 33.5 months	Number of Live Plugs	Mortality 39.5 months
Finger coral	2	2	0%	2	0%	1	50%	1	50%
Leaf coral	1	1	0%	1	0%	1	0%	1	0%
Pencil coral	5	4	20%	4	20%	4	20%	4	20%
Staghorn coral	24	12	50%	12	50%	2	92%	2	92%
Solitary disk coral	1	0	100%	0	100%	0	100%	0	100%
		Mean		Mean		Mean		Mean	
TOTALS	33	19	42%	19	42%	8	76%	8	76%

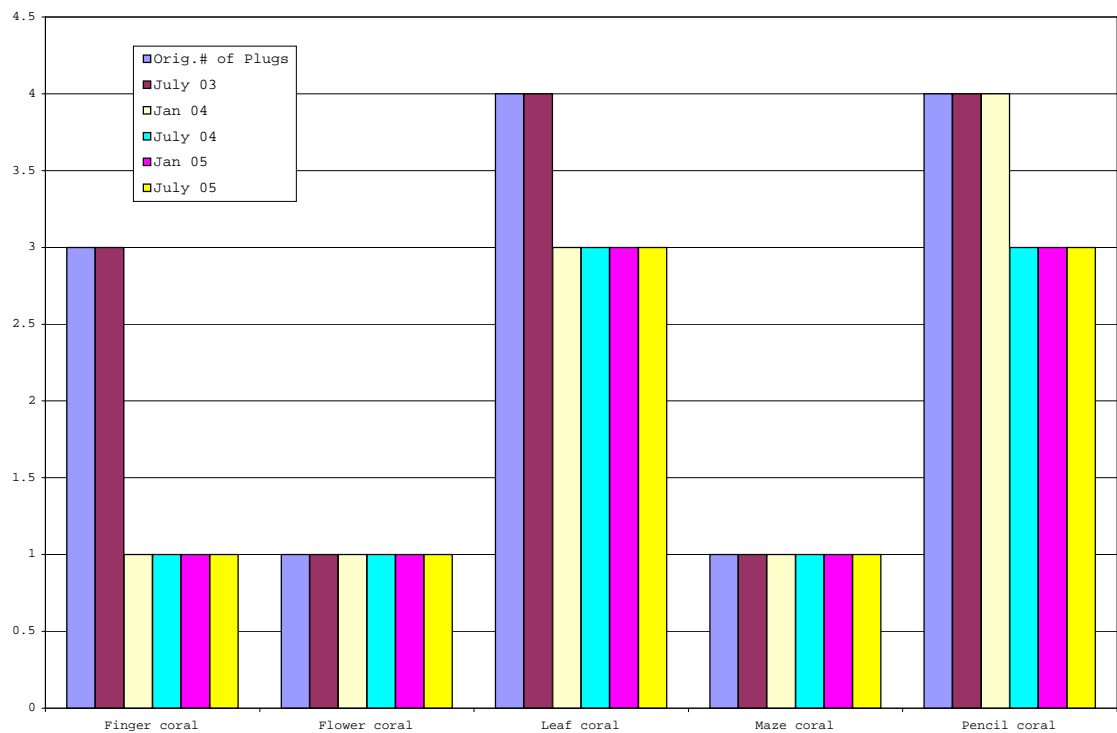
Coral Plug Survival Chart East Side Reef Balls Cluster 12



PORTOMAREA MARINE MONITORING
Coral Plug Survival Summary
East Side Reef Balls, Cluster 18

Coral Species	Orig.# of Plugs	July 2003 Monitoring		January 2004 Monitoring		July 2004 Monitoring		January 2005 Monitoring		July 2005 Monitoring	
		Number of Live Plugs	Mortality 2 months	Number of Live Plugs	Mortality 8 months	Number of Live Plugs	Mortality 14 months	Number of Live Plugs	Mortality 20 months	Number of Live Plugs	Mortality 26 months
Finger coral	3	3	0%	1	67%	1	67%	1	67%	1	67%
Flower coral	1	1	0%	1	0%	1	0%	1	0%	1	0%
Leaf coral	4	4	0%	3	25%	3	25%	3	25%	3	25%
Maze coral	1	1	0%	1	0%	1	0%	1	0%	1	0%
Pencil coral	4	4	0%	4	0%	3	25%	3	25%	3	25%
Star coral	4	4	0%	4	0%	4	0%	4	0%	4	0%
Sea rod black	3	3	0%	3	0%	3	0%	3	0%	3	0%
Sea rod white	1	1	0%	1	0%	1	0%	1	0%	1	0%
			Mean		Mean		Mean		Mean		Mean
TOTALS	21	21	0%	18	14%	17	19%	17	19%	17	19%

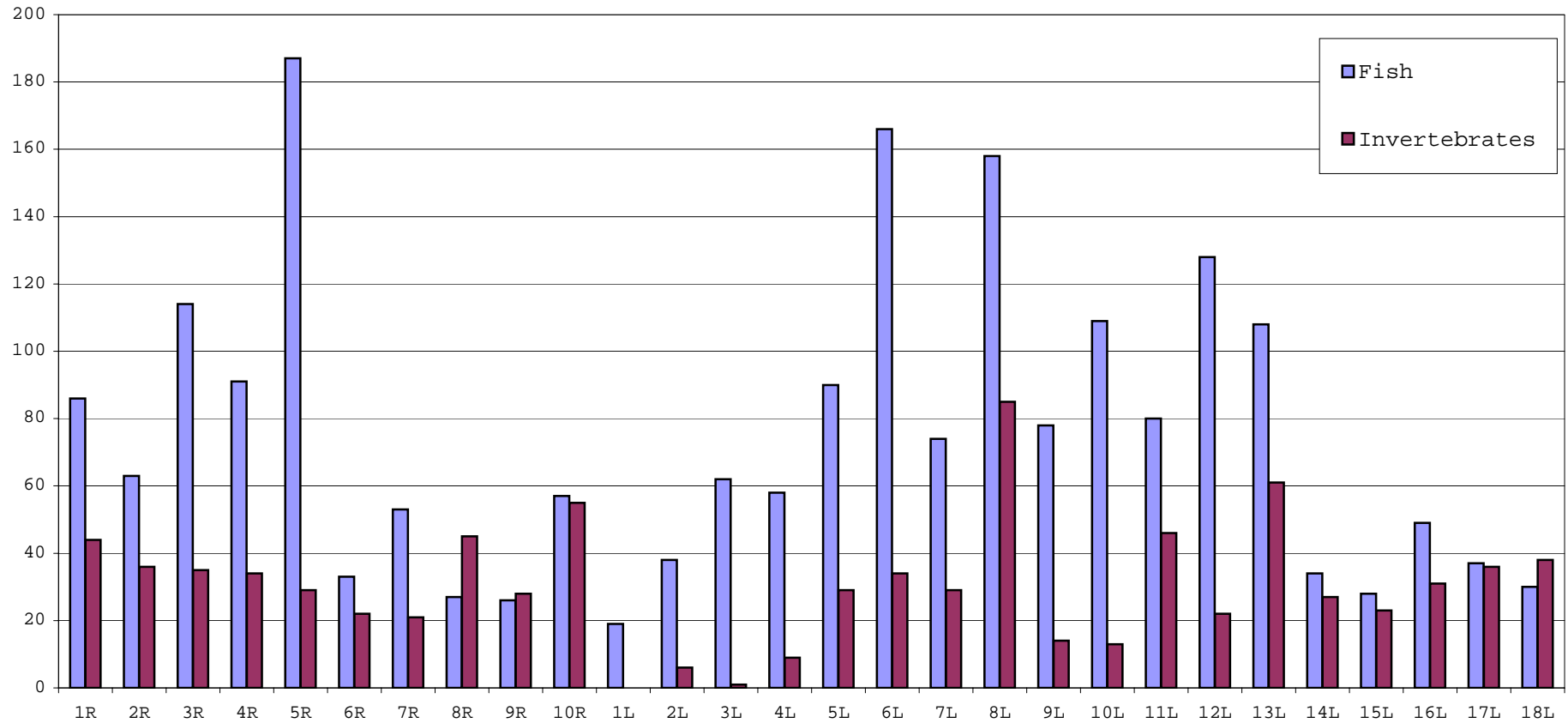
Coral Plug Survival Chart East Side Reef Balls Cluster 18



**PORTOMAREA MARINE MONITORING
REEF BALL CLUSTERS
FISH AND INVERTEBRATE POPULATION SUMMARY**

Cluster No.	No.of Fish	% of Total	No.of Invertebrates	% of Total
1R	86	4.13	44	4.22
2R	63	3.02	36	4.22
3R	114	5.47	35	4.10
4R	91	4.37	34	3.99
5R	187	8.98	29	3.40
6R	33	1.58	22	2.58
7R	53	2.54	21	2.46
8R	27	1.30	45	5.28
9R	26	1.25	28	3.28
10R	57	2.74	55	6.45
1L	19	0.91	0	0.00
2L	38	1.82	6	0.70
3L	62	2.98	1	0.12
4L	58	2.78	9	1.06
5L	90	4.32	29	3.40
6L	166	7.97	34	3.99
7L	74	3.55	29	3.40
8L	158	7.59	85	9.96
9L	78	3.74	14	1.64
10L	109	5.23	13	1.52
11L	80	3.84	46	5.39
12L	128	6.14	22	2.58
13L	108	5.18	61	7.15
14L	34	1.63	27	3.17
15L	28	1.34	23	2.70
16L	49	2.35	31	3.63
17L	37	1.78	36	4.22
18L	30	1.44	38	4.45
TOTAL	2083	100	853	99.06

**PORTOMAREA MARINE MONITORING
FISH AND INVERTEBRATE POPULATION SUMMARY CHART
REEF BALL CLUSTERS**



PORTOMAREA MARINE MONITORING

FISH and INVERTEBRATE SURVEY - REEF BALL CLUSTERS WEST

DATE: June 28 , 2005

TIME: 8.50 a.m.

Data collected and recorded by: Marjo van den Bulck

CLUSTER NUMBER		1R	2R	3R	4R	5R	6R	7R	8R	9R	10R				
DEPTH		1.2m	1.4m	1.2m	1.6m	1.8m	2.7m	2.9m	3.6m	3.8m	3.8m		Total	Mean	St.Dev.
FISH															
ANGELFISH	French Angelfish	1	1	2	1								5	1.25	0.50
BASSLET	Fairy Basslet														
BLENNY	Redlip Blenny	1				2		2		1			6	1.50	0.58
	Saddled Blenny			2	1								3	1.50	0.71
BOXFISH	Smooth Trunkfish			1					1		1		3	1.00	
BUTTERFLYFISH	Banded Butterflyfish			1	1	3					2		7	1.75	0.96
	Foureye Butterflyfish										2		2	2.00	
CARDINALFISH	Belted Cardinalfish			1		6							7	3.50	3.54
CHROMIS	Blue Chromis														
	Brown Chromis	9	1	24	4	50		9					97	16.17	18.37
DAMSELFISH	Beaugregory			2	1								3	1.50	0.71
	Bicolor Damselfish	3	7	38	8	6			5				67	11.17	13.26
	Cocoa Damselfish	1	2	1		2	2				1		9	1.50	0.55
	Dusky Damselfish					3	4	3		2	15		27	5.40	5.41
	Sergeant Major	15	6	2	2	1		3	2		6		37	4.63	4.60
	Threespot Damselfish			3									3	3.00	
DRUM	Spotted Drum												1	1.00	
EEL	Chain Moray			1									1	1.00	
	Spotted Moray														
FILEFISH	Orange Filefish				1								1	1.00	
	Scrawled Filefish														
FLOUNDER	Peacock Flounder	1		1									2	1.00	
GOATFISH	Spotted Goatfish			1									1	1.00	
	Yellow Goatfish	23		2	2								27	9.00	12.12
GOBY	Bridled Goby	3	4	1	1		7	2	6	7	3		34	3.78	2.39
	Neon Goby														
GROUPER	Coney						2	1			1		4	1.33	0.58
	Graysby		1										2	1.00	
	Rock Hind														
GRUNT	Bluestriped Grunt														
	French Grunt		2	1	1	3	1	1			1		10	1.43	0.79
	Smallmouth Grunt										1		1	1.00	
	White Grunt														
	Ceasar Grunt					1							1	1.00	
HAMLET	Yellowtail Hamlet														
HOGFISH	Spanish Hogfish														
JACK	Bar Jack	10				1							11	5.50	6.36
	Palometa	2	7	6	8								23	5.75	2.63
PARROTFISH	Blue Parrotfish														
	Princess Parrotfish					1	5	1					7	2.33	2.31
	Queen Parrotfish					1	1			1	5		8	2.00	2.00
	Redband Parrotfish			1					1		1		3	1.00	
	Stoplight Parrotfish							1			1		2	1.00	
	Striped Parrotfish														
PUFFER	Sharpnose Puffer		1		2			1					4	1.33	0.58
	Porcupine														
SCORPIONFISH	Spotted Scorpionfish	1	1		1	1							4	1.00	
SEABASS	Harlequin Bass						1						1	1.00	
SNAPPER	Gray Snapper								1	1			2	1.00	
	Yellowtail Snapper														
	Mutton Snapper														
SQUIRRELFISH	Blackbar Soldierfish						5	7		1	9		22	5.50	3.42
	Squirrelfish	1								1	1	2	5	1.25	0.50
SURGEONFISH	Blue Tang	1	1	1	1		1						5	1.00	
	Doctorfish				2			1					3	1.50	0.71
	Ocean Surgeonfish										1		1	1.00	
WRASSE	Bluehead Wrasse	5	20	16	43	100	1	16	9	12			222	24.67	30.69
	Clown Wrasse	1	1		5						1		8	2.00	2.00
	Puddingwife	1		2	2	2	1	1					9	1.50	0.55
	Rainbow Wrasse														
	Slippery Dick	3	5	2	2	3							15	3.00	1.22
	Yellowhead Wrasse						1	2					3	1.50	0.71
OTHERS	Lizardfish, Bluestriped														
	Mojarra, Yellowfin	4	3	2	2								11	2.75	0.96
	Soapfish, Greater					1		2			3		6	1.00	1.00
	Trumpetfish										1		1	1.00	
TOTAL		86	63	114	91	187	33	53	27	26	57		737	73.7	
INVERTEBRATES															
													Total	Mean	St.Dev.
ANEMONE	Corkscrew Anemone	2	1	1	1	1	2	1		2			11	1.38	0.52
	Knobby Anemone									5	1		6	3.00	2.83
	Giant Anemone	1			2	5	8	2				2	20	3.33	2.66
ENCHINODERMS	Pencil Urchin			2		1							3	1.50	0.71
	Reef Urchin	1											1	1.00	
	Longspined Sea Urchin	2	2	1	1	3							9	1.80	0.84
CRUSTACEANS	Banded Coral Shrimp	2			1				1		2		6	1.50	0.58
	Pederson Cleaner Shrimp							1					1	1.00	
	Nimble Spray Crab	1	5	2		3							11	2.75	1.71
	Yellowline Arrow Crab									1			1	1.00	
TUBE WORMS	Christmas Tree Worm	31	27	25	26	9	9	12	28	9	43		219	21.90	11.62
	Ghost Feather Duster														
	Magnificent Feather D.														
	Split Crown Feather D.														
	Star Horseshoe Worm						1	4	5	4			14	3.50	1.73
	Variegated Feather D.						1		1	5	4		11	2.75	2.06
MOLLUSKS	Amber Penshell					1		1		2			4	1.33	0.58
	Atlantic Pearl Oyster														
	Lettuce Sea Slug										1		1	1.00	
SPONGES	Lumpy Overgrowing Sponge	4	1	4	3	6	1	4	4	4			31	3.44	1.59
TOTAL		44	36	35	34	29	22	21	45	28	55		349	34.9	

Note: Previous observations (jan and april 2002) of Beaded Anemone are in fact Knobby Anemone.

PORTOMAREA MARINE MONITORING

FISH and INVERTEBRATE SURVEY - REEF BALL CLUSTERS EAST

DATE: June 30, 2005

Data collected and recorded by: Marjo van den Bulck

TIME: 08:15 a.m.

CLUSTER NUMBER	1L	2L	3L	4L	5L	6L	7L	8L	9L	10L	11L	12L	13L	14L	15L	16L	17L	18L	Total	Mean	St. Dev.	
DEPTH	1.5m	1.5m	1.6m	1.6m	2.1m	2.1m	2.4m	2.7m	3.2m	3.4m	4.3m	4.3m	4.3m	4.3m	4.3m	4.3m	4.3m	4.3m				
ANGELFISH																						
	French Angelfish																		2	1		
	Queen Angelfish																			2	1	
BLENNY	Redlip Blenny																		1	1		
	Saddled Blenny																		1	1		
	Spiny Head Blenny																					
BOXFISH	Smooth Trunkfish																			1		
	Spotted Trunkfish																		1			
BUTTERFLYFISH	Banded Butterflyfish																			1		
	Foureye Butterflyfish																			1	1	
CARDINALFISH	Belted Cardinalfish																		8	7	16	
CHROMIS	Brown Chromis																		7	42	40	
DAMSELFISH	Beaugregory Damselfish																			2	1	
	Bicolor Damselfish																		5	15	8	
	Cocoa Damselfish																		2	1	2	
	Dusky Damselfish																		4	2	3	
	Sergeant Major																		1	3	1	
	Threespot Damselfish																		3			
	Yellowtail Damselfish																		1	2	2	
EEL	Spotted Moray																			1		
FILEFISH	Orange Filefish																		1			
	Scrawled Filefish																				1	
FLOUNDER	Peacock Flounder																					
GOATFISH	Spotted Goatfish																					
	Yellow Goatfish																			1	2	
GOBY	Bridled Goby																		1	3	4	
	Neon Goby																				1	
GROUPE	Coney																			1	2	
	Graysby																				1	
	Red Hind																					
GRUNT	Ceasar Grunt																				1	
	French Grunt																		2	2	3	
	Juvenile Grunt U.I.																			4	2	
HAMLET	Butter Hamlet																					
HOGFISH	Spanish Hogfish																				1	
JACK	Bar Jack																					
PARROTFISH	Princess Parrotfish																		1	5	2	
	Queen Parrotfish																		2	1	1	
	Redband Parrotfish																			1	1	
	Redtail Parrotfish																				1	
	Stoplight Parrotfish																			1	1	
	Striped Parrotfish																				2	
PUFFER	Balloonfish																		1			
	Sharpnose Puffer																				1	
SCORPIONFISH	Spotted Scorpionfish																					
SEABASS	Harlequin Bass																			1		
SNAPPER	Gray Snapper																		1	1		
	Schoolmaster																				1	
SQUIRRELFISH	Squirrelfish																		1	1	1	
SURGEONFISH	Blue Tang																			1	1	
	Doctorfish																			1	3	
	Ocean Surgeonfish																		2	4	8	
WRASSE	Bluehead Wrasse																		10	24	5	
	Clown Wrasse																		3	1	1	
	Puddingwife																		4	1	1	
	Slippery Dick																		4	5	3	
	Yellowhead Wrasse																				1	
OTHERS	Mojarra, Yellowfin																		1			
	Sand Diver																				1	
	Soapfish, Greater																		1	1		
	Trumpetfish																				2	
TOTAL	19	38	62	58	90	166	74	158	78	109	80	128	108	34	28	49	37	30	1346	74.78		
INVERTEBRATES																				Total	Mean	St. Dev.
ANEMONE	Corkscrew Anemone																		1	1	1	
	Giant Anemone																		5	1	8	
	Knobby Anemone																		2	1	1	
CRUSTACEANS	Banded Coral Shrimp																					
	Nimble Spray Crab																		1	2	3	
	Pederson Cleaner Shrimp																					
	Yellowline Arrow Crab																				1	
SEGM. WORMS	Bearded Fireworm																					
	Christmas Tree Worm																		4	1	14	
	Ghost Feather Duster																				22	
	Star Horse Shoe Worm																				17	
	Variegated Pth.Dstr.																				72	
MOLLUSKS	Amber Penshell																				5	
	Atlantic Thorny Oyster																				42	
	Lettuce Sea Slug																				12	
	Spiny File Clam																				36	
SPONGES	Lumpy Overgrowing Sponge																		1	1	2	
ECHINODERMS	Pencil Urchin																		1			
	Longspined Sea Urchin																			5	3	
	West Indian Sea Egg																		1		5	
TOTAL	6	1	9	29	34	29	85	14	13	46	22	61	27	23	31	36	38	504	28.00			

Note: Previous observations (jan and april 2002) of Beaded Anemone are in fact Knobby Anemone.