

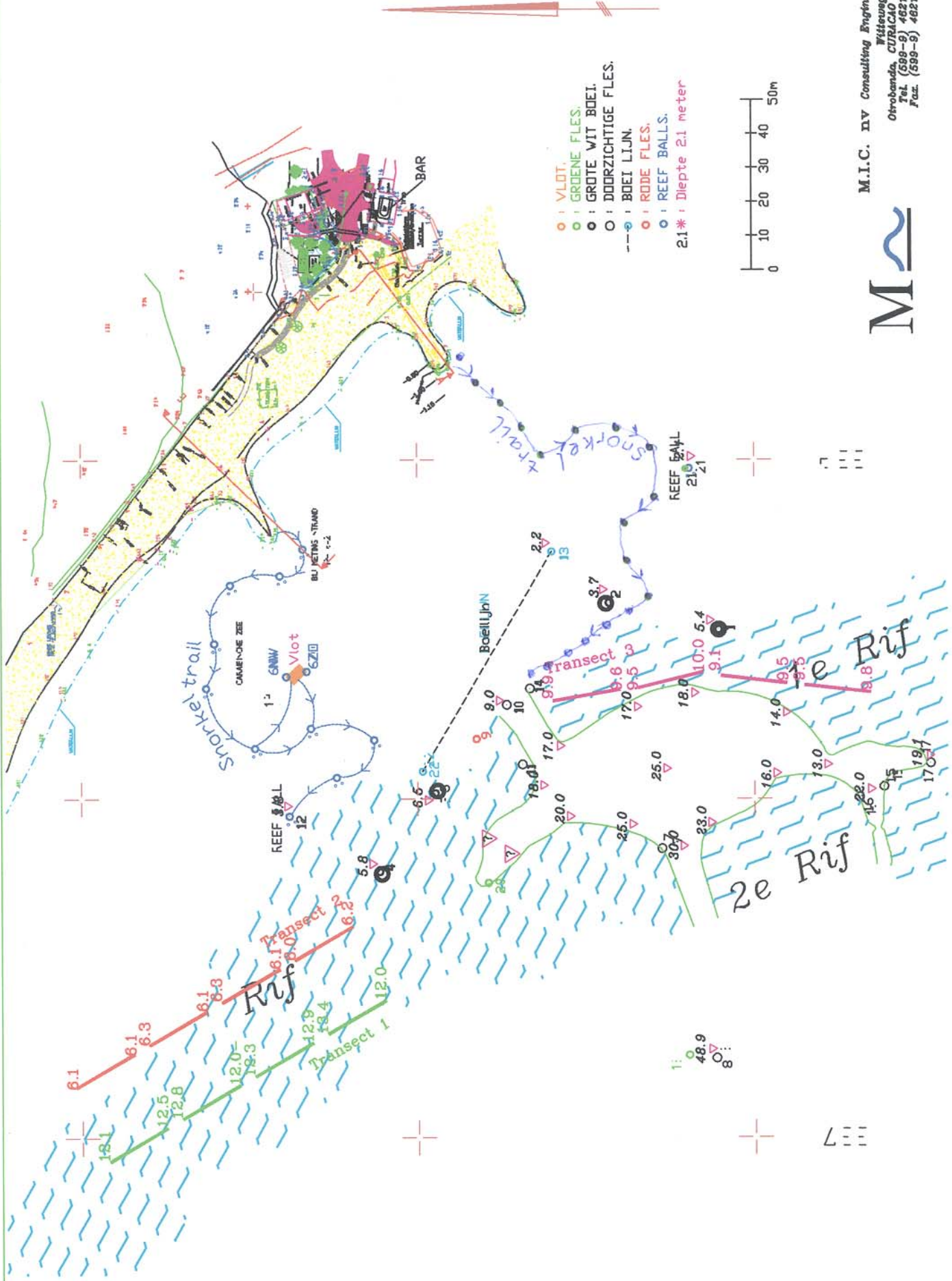
# **PORTOMAREA MARINE MONITORING**

## **CORAL AND FISH/INVERTEBRATE SURVEY**

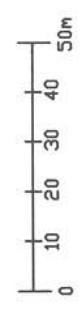
by

Marjo van den Bulck

**January 2006**



- VLDT.
  - GROENE FLES.
  - GROTE WIT BOEI.
  - DOORZICHTIGE FLES.
  - BOEI LIJN.
  - RODE FLES.
  - REEF BALLS.
- 2.1\* : Diepte 2.1 meter



M.I.C. nv Consulting Engineers  
 Witteweg 16  
 Otrobanda, CURAÇAO N.A.  
 Tel. (599-9) 4621508  
 Fax. (599-9) 4621509



# PORTOMAREA MARINE MONITORING

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## **PORTOMAREA MARINE MONITORING**

### **FISH/INVERTEBRATE AND CORAL SURVEY OVERVIEW**

Survey dates: January 5 - January 22, 2006.

Data observed and recorded by: Marjo van den Bulck

During 2006 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 this monitoring period.

Visibility varied from 10m to 30m. Average visibility 21,8m.

During two monitoring dives currents occurred in the bay and on the outer second reef. When those currents occurred, visibility dropped to 10 meter.

### **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.

One rebar replaced, 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

During the transects check dive a lot of Y branched algae were noticed on the reef.

## **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 staghorn 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 saghorn 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**

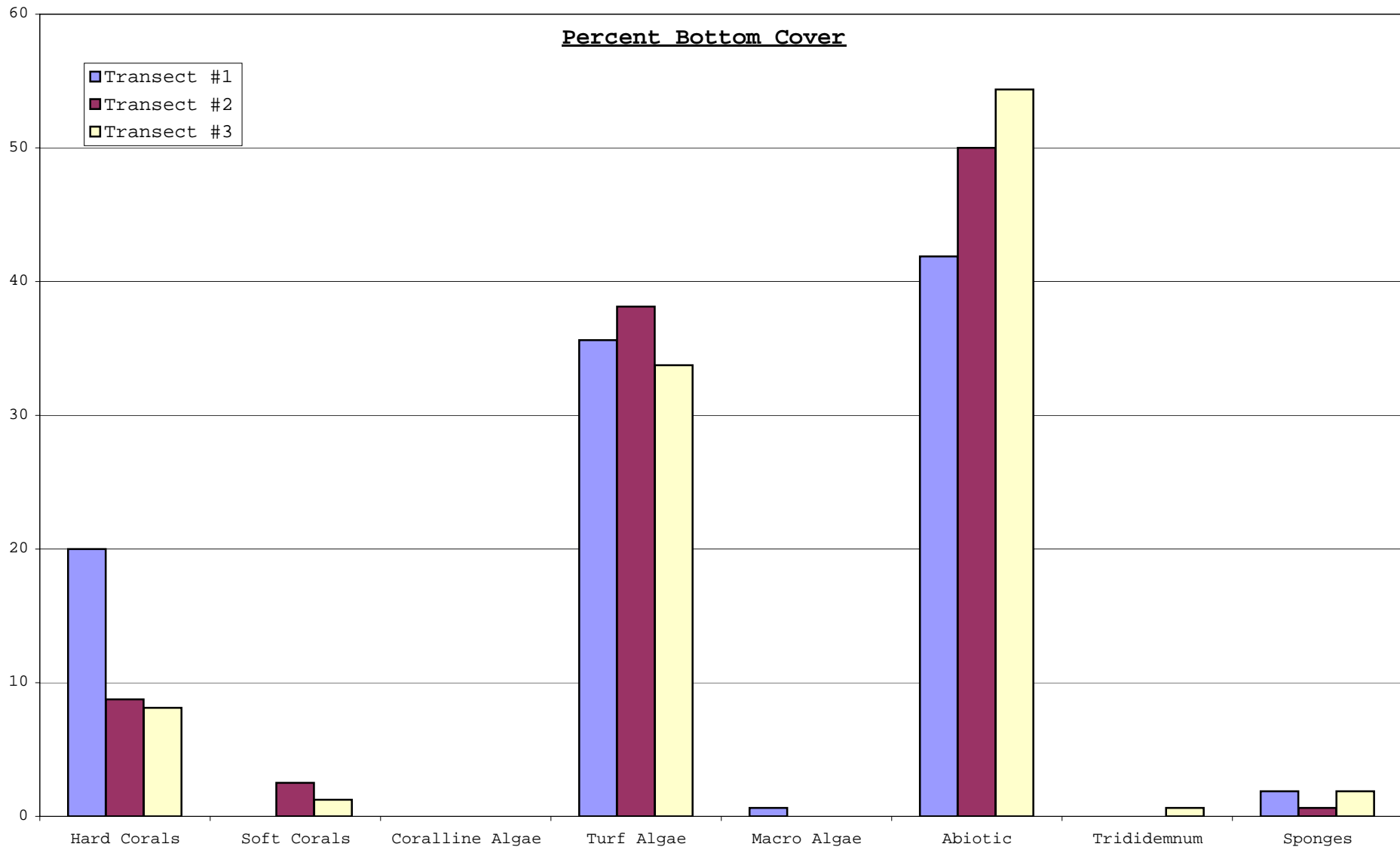
This report also shows an increased number of different species of Sea Urchins.

**PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY**

Date : January 2006  
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	10	1	0	0	0	0	0	16	0	13	0	0	40
	25-45m	11	11	0	0	0	0	0	0	13	0	14	0	2	40
	50-70m	7	5	2	0	0	0	0	0	12	1	20	0	0	40
	75-95m	3	3	0	0	0	0	0	0	16	0	20	0	1	40
	Mean	8	7	1	0	0	0	0	0	14	0	17	0	1	40
	% cover	20	91	9	0	0	0	0	0	36	1	42	0	2	100
	standard deviation	3.83	3.86	0.96	0.00	0.00	0.00	0.00	0.00	2.06	0.50	3.77	0.00	0.96	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	13	0	25	0	0	40
	25-45m	3	3	0	0	0	0	0	0	14	0	23	0	0	40
	50-70m	6	5	0	1	0	0	0	0	14	0	20	0	0	40
	75-95m	3	3	0	0	0	0	4	0	20	0	12	0	1	40
	Mean	4	3	0	0	0	0	1	0	15	0	20	0	0	40
	% cover	9	93	0	7	0	0	3	0	38	0	50	0	1	100
	standard deviation	1.73	1.26	0.00	0.50	0.00	0.00	2.00	0.00	3.20	0.00	5.72	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	5	4	1	0	0	0	0	0	13	0	20	1	1	40
	25-45m	1	1	0	0	0	0	2	0	9	0	26	0	2	40
	50-70m	3	3	0	0	0	0	0	0	14	0	23	0	0	40
	75-95m	4	4	0	0	0	0	0	0	18	0	18	0	0	40
	Mean	3	3	0	0	0	0	1	0	14	0	22	0	1	40
	% cover	8	92	8	0	0	0	1	0	34	0	54	1	2	100
	standard deviation	1.71	1.41	0.50	0.00	0.00	0.00	1.00	0.00	3.70	0.00	3.50	0.50	0.96	0.00

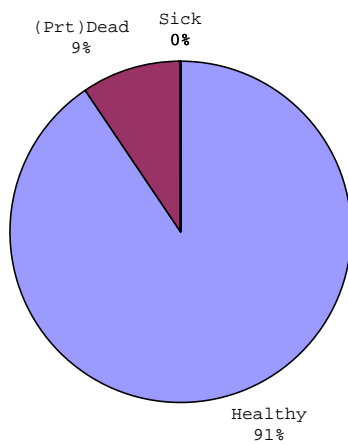
PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY



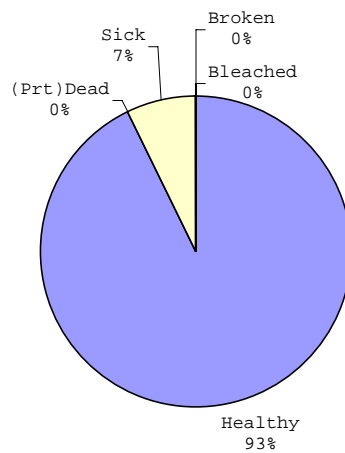


PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECTS - CORAL HEALTH CHART

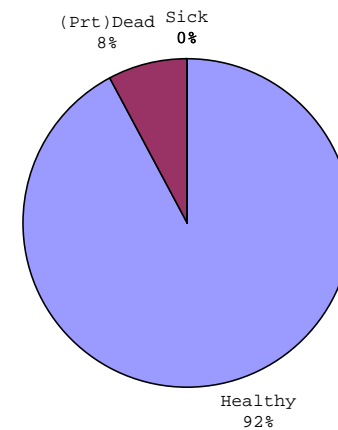
Transect 1, Depth 12m



Transect 2, Depth 6m



Transect 3, Depth 10m



**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

HARD CORALS										CONDITION/REMARKS				SOFT CORALS				
M	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			Boulder						Healthy									
2																TA		
2.5																TA		
3																YA		
3.5																TA		
4			Boulder						Healthy									
4.5																TA		
5																SD		
5.5																RC		
6			Boulder						Healthy									
6.5																SD		
7																YA		
7.5																RB		
8						Lettuce			Healthy									
8.5						Lettuce			Healthy									
9																SD		
9.5																RB		
10																YA		
10.5																SD		
11																SD		
11.5		Mustard							Healthy									
12																YA		
12.5						Lettuce			Dead,partially 80%									
13																TA		
13.5																RC		
14																YA		
14.5																TA		
15																RB		
15.5				Brain					Healthy									
16																YA		
16.5																RB		
17																YA		
17.5																YA		
18																YA		
18.5		Mustard							Healthy									
19			Boulder						Healthy									
19.5		Mustard							Healthy									
20																BA		
<b>Total</b>	0	3	4	1	0	3	0	0	0	1	10	0	0	0	0	16	13	
	0	6	8	4	2	8	0	4	3	29	0	0	0	1	57	67	<b>GRAND TOTAL</b>	

**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: 1, Depth: 12m, Section 25-45m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: January 21, 2006      Temperature: 26C

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					Finger				Healthy								
1.5														YA			
2		Mustard							Healthy								
2.5				Brain					Healthy								
3				Brain					Healthy								
3.5																RC	
4														BA			
4.5																SD	
5																SD	
5.5														BA			
6														YA			
6.5																SD	
7								Flower	Healthy								
7.5																YA	
8			Boulder						Healthy								
8.5																SD	
9														YA			
9.5																SD	
10																SD	
10.5															TA		
11														YA			
11.5															BA		
12									Black Sponge		BLA						
12.5																SD	
13																SD	
13.5			Boulder						Healthy								
14															TA		
14.5														YA			
15									Brown Sponge		BRO						
15.5														YA			
16																RB	
16.5		Mustard							Healthy								
17			Boulder						Healthy								
17.5														TA			
18																RC	
18.5						Lettuce			Healthy								
19								Flower	Healthy								
19.5																RC	
20																SD	
<b>Total</b>	0	2	3	2	1	1	0	2	0	11	0	0	0	0	13	14	

**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: 1, Depth 12m, Section 50-70m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: January 22, 2006      Temperature: 26C

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															BA		
1																RC	
1.5															BA		
2																SD	
2.5						Lettuce			Healthy								
3																SD	
3.5															YA		
4								Flower	Dead, partially 80%								
4.5					Finger				Dead, partially 80%								
5															YA		
5.5																SD	
6															TA		
6.5						Lettuce			Healthy								
7						Lettuce			Healthy								
7.5																SD	
8																SD	
8.5																SD	
9																SD	
9.5																SD	
10																SD	
10.5				Grooved					Healthy								
11														MATA			
11.5															YA		
12															TA		
12.5															TA		
13															BA		
13.5															BA		
14			Boulder						Healthy								
14.5																SD	
15																SD	
15.5																SD	
16															TA		
16.5																SD	
17																SD	
17.5																SD	
18																RB	
18.5															YA		
19																SD	
19.5																SD	
20																SD	
<b>Total</b>	0	0	1	1	1	3	0	1	2	5	0	0	0	0	1	12	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: 25 m		Observer: Marjo van den Bulck													
Date: January 22, 2006		Temperature: 26C															
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															BA		
2																RB	
2.5															YA		
3															YA		
3.5															YA		
4															TA		
4.5															TA		
5																SD	
5.5		Mustard						Healthy									
6															YA		
6.5																SD	
7																RC	
7.5																SD	
8								Brown Sponge		BRO							
8.5																SD	
9																SD	
9.5						Lettuce		Healthy									
10							Flower	Healthy									
10.5															BA		
11															TA		
11.5															TA		
12															BA		
12.5															YA		
13																RC	
13.5																SD	
14															TA		
14.5																SD	
15															YA		
15.5																SD	
16																SD	
16.5																SD	
17																SD	
17.5																SD	
18															YA		
18.5																SD	
19																SD	
19.5																RC	
20															YA		
<b>Total</b>	0	1	0	0	0	1	0	1	0	3	0	0	0	0	16	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	PU Blue Green Algae	PUR 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: January 17, 2006		Temperature: 26C															
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															TA		
1															TA		
1.5																RB	
2																RB	
2.5															TA		
3			Smooth						Healthy								
3.5																RB	
4															YA		
4.5																SD	
5																RC	
5.5																RB	
6																RB	
6.5																SD	
7															BA		
7.5																SD	
8															BA		
8.5																RB	
9																SD	
9.5																RB	
10																RB	
10.5																SD	
11						Lettuce			Healthy								
11.5																RB	
12																SD	
12.5																RB	
13															BA		
13.5																RC	
14																RB	
14.5															BA		
15															BA		
15.5																SD	
16																SD	
16.5															BA		
17															BA		
17.5															BA		
18																SD	
18.5																RB	
19																SD	
19.5															BA		
20																RB	
<b>Total</b>	0	0	1	0	0	1	0	0	0	0	2	0	0	0	0	13	25
	0	4	5	3	0	1	1	0	0	13	1	0	0	0	0	61	80
<b>Substrate Codes:</b>																	
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 25-45m      Visibility: 20 m      Observer: Marjo van den Bulck  
 Date: January 17, 2006      Temperature: 26C

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																RB	
2																RB	
2.5																RB	
3																SD	
3.5															BA		
4															YA		
4.5															TA		
5															BA		
5.5		Mustard						Healthy									
6																SD	
6.5															BA		
7		Maze						Healthy									
7.5																RB	
8																RB	
8.5															BA		
9																RB	
9.5															TA		
10		Mustard						Healthy									
10.5																RC	
11															BA		
11.5																RB	
12																RB	
12.5															TA		
13																RB	
13.5																SD	
14															BA		
14.5															BA		
15															BA		
15.5																RB	
16															TA		
16.5																RB	
17																RB	
17.5																RB	
18																RB	
18.5																RB	
19															BA		
19.5																SD	
20																RB	
<b>Total</b>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	14	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	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: January 17, 2006      Temperature: 26C

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															SD		
1.5															TA		
2															TA		
2.5															YA		
3															YA		
3.5			Boulder					Healthy									
4															TA		
4.5																SD	
5																SD	
5.5															TA		
6							Fire	Healthy, on Gorgonian									
6.5																RC	
7															TA		
7.5																RB	
8																RB	
8.5															TA		
9																SD	
9.5																SD	
10																RC	
10.5																RKC	
11															TA		
11.5															TA		
12			Boulder					Healthy									
12.5																RB	
13																RB	
13.5																RKC	
14			Boulder					Healthy									
14.5															TA		
15															TA		
15.5			Boulder					Healthy									
16				Brain				Sick, Whiteband									
16.5															TA		
17																RC	
17.5															TA		
18																RC	
18.5																SD	
19																SD	
19.5																RB	
20																SD	
<b>Total</b>	0	0	4	1	0	0	1	0	0	5	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: 2, Depth 6m, Section 75-95m      Visibility: 20 m      Observer: Marjo van den Bulck  
 Date: January 17, 2006      Temperature: 26C

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				Grooved					Healthy														
1																RC							
1.5				Brain					Healthy														
2																RB							
2.5																SD							
3									Sea Plume	PU													
3.5																YA							
4																TA							
4.5																TA							
5									BSR	BLA													
5.5																TA							
6																RB							
6.5									Yellow Tube Sponge		YE												
7		Maze							Healthy														
7.5																TA							
8																TA							
8.5									BSR	BLA													
9									BSR	BLA													
9.5																SD							
10																YA							
10.5																TA							
11																TA							
11.5																SD							
12																SD							
12.5																BA							
13																SD							
13.5																BA							
14																TA							
14.5																TA							
15																RB							
15.5																RB							
16																TA							
16.5																TA							
17																TA							
17.5																TA							
18																BA							
18.5																SD							
19																RB							
19.5																BA							
20																YA							
<b>Total</b>	0	1	0	2	0	0	0	0		0	3	0	0			4	1	0	0	0	0	20	12

**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	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: 30 m      Observer: Marjo van den Bulck  
 Date: January 16, 2006      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															TA		
1																RB	
1.5															TA		
2															TA		
2.5	Pencil								Dead, partially 90%								
3															YA		
3.5															YA		
4															YA		
4.5																SD	
5																RB	
5.5															YA		
6															YA		
6.5			Boulder						Healthy								
7																SD	
7.5															TA		
8																SD	
8.5																SD	
9																SD	
9.5																SD	
10												TRI					
10.5		Mustard							Healthy							RC	
11																RC	
11.5															YA		
12															TA		
12.5				Brain					Healthy								
13															TA		
13.5																SD	
14																SD	
14.5																SD	
15																SD	
15.5																SD	
16																SD	
16.5																SD	
17																SD	
17.5									Brown Sponge		BRO						
18			Boulder						Healthy						TA		
18.5																SD	
19																SD	
19.5																RC	
20																SD	
<b>Total</b>	1	1	2	1	0	0	0	0	0	1	4	0	0	0	13	20	
	1	3	4	1	0	3	1	0	1	12	0	0	0	0	54	87	

**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: 320 m      Observer: Marjo van den Bulck  
 Date: January 16, 2006      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														TA			
1.5																SD	
2														TA			
2.5														TA			
3																SD	
3.5																SD	
4																SD	
4.5																SD	
5								Black Sponge		BLA							
5.5																RB	
6																SD	
6.5																SD	
7																SD	
7.5																SD	
8														TA			
8.5																SD	
9																SD	
9.5																SD	
10								Yellow Sponge		YE							
10.5																SD	
11		Maze						Healthy									
11.5														YA			
12								Sea Plume		PU							
12.5																	
13								Encrusting Gorgonian		ENCR							
13.5																SD	
14																SD	
14.5																SD	
15																SD	
15.5																SD	
16																SD	
16.5																SD	
17															BA		
17.5															TA		
18															TA		
18.5															TA		
19																SD	
19.5																RB	
20																RB	
<b>Total</b>	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	9	26

**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: 30 m      Observer: Marjo van den Bulck  
 Date: January 16, 2006      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															TA		
1.5															TA		
2																SD	
2.5																SD	
3																SD	
3.5																SD	
4																SD	
4.5																SD	
5															TA		
5.5																RC	
6																RC	
6.5																SD	
7																RB	
7.5															YA		
8																RC	
8.5																SD	
9															BA		
9.5															BA		
10															BA		
10.5															TA		
11																SD	
11.5																SD	
12																RB	
12.5																RB	
13															TA		
13.5															YA		
14																SD	
14.5															TA		
15																RB	
15.5															YA		
16							Boulder									Healthy	
16.5																Lettuce	
17																Healthy	
17.5																YA	
18																YA	
18.5																SD	
19																RB	
19.5																RB	
20																RC	
<b>Total</b>	0	0	1	0	0	2	0	0	0	0	3	0	0	0	0	14	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: 30 m      Observer: Marjo van den Bulck  
 Date: January 16, 2006      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														YA			
2.5																SD	
3																RB	
3.5																SD	
4														TA			
4.5																SD	
5														YA			
5.5																SD	
6														TA			
6.5						Lettuce			Healthy					YA			
7														YA			
7.5							Fire		Healthy								
8														TA			
8.5																RB	
9														TA			
9.5																SD	
10																RB	
10.5																SD	
11														TA			
11.5														TA			
12														TA			
12.5														TA			
13																SD	
13.5																SD	
14																SD	
14.5														YA			
15														TA			
15.5														YA			
16																SD	
16.5			Boulder						Healthy								
17		Mustard							Healthy								
17.5														YA			
18														YA			
18.5																SD	
19														TA			
19.5														TA			
20																RB	
<b>Total</b>	0	1	1	0	0	1	1	0	0	4	0	0	0	0	0	18	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	
		TR Trididemnum	

PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT SUMMARY: FISH and INVERTEBRATES

Jan-06

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			
ANGELFISH	Cherubfish	1	1		2	0.67	0.58
	French Angelfish						
	Queen Angelfish						
	Rock Beauty	1			1	0.50	0.71
BASSLET	Fairy Basslet	9		3	12	6.00	4.24
BLENNY	Redlip Blenny						
BOXFISH	Honeycomb Cowfish						
	Smooth Trunkfish	1	2	4	7	2.33	1.53
BUTTERFLYFISH	Banded Butterflyfish	3	2		5	1.67	1.53
	Four-eye Butterflyfish	3	4	4	11	3.67	0.58
	Longsnout Butterflyfish	1			1	0.50	0.71
CHROMIS	Blue Chromis	72	3		75	25.00	40.73
	Brown Chromis	377	146	515	1038	346.00	186.44
DAMSELFISH	Beaugregory Damselfish						
	Bicolor Damselfish	243	419	323	985	328.33	88.12
	Cocoa Damselfish		16	5	21	10.50	7.78
	Dusky Damselfish		28	10	38	19.00	12.73
	Sergeant Major	1			1	0.33	0.58
	Threespot Damselfish	60	18	17	95	31.67	24.54
	Yellowtail Damselfish		1		1	1.00	
DRUM	Spotted Drum	1	1		2	1.00	
EEL	Goldentail Moray			2	2	1.00	1.41
	Green Moray	1			1	1.00	
	Spotted Moray	3	1	1	5	1.67	1.15
FILEFISH	Orangespotted Filefish		2		2	1.00	1.41
	Scrawled Filefish			1	1	0.50	0.71
FLOUNDER	Peacock Flounder						
GOATFISH	Spotted Goatfish						
	Yellow Goatfish	17	1	13	31	10.33	8.33
GOBY	Bridled Goby	81	34	166	281	93.67	66.91
	Neon Goby		5	1	6	2.00	2.65
	Peppermint Goby	3	16		19	6.33	8.50
	Coney		6	10	16	8.00	2.83
GROUPE	Graysby	12	2	7	21	7.00	5.00
	Rock Hind						
	Tiger Grouper						
	Ceasar Grunt		1		1	0.33	0.58
GRUNT	French Grunt	7	6	7	20	6.67	0.58
	Striped Grunt		1	41	42	14.00	23.39
	Barred Hamlet			1	1	0.33	0.58
HAMLET	Black Hamlet						
	Butter Hamlet	1			1	0.33	0.58
	Yellowtail Hamlet	4	1	2	7	2.33	1.53
HOGFISH	Spanish Hogfish	1		3	4	1.33	1.53
JACK	Bar Jack			2	2	0.67	1.15
MACKEREL	Cero						
PARROTFISH	Blue Parrotfish						
	Princess Parrotfish	26	9	16	51	17.00	8.54
	Queen Parrotfish		1	3	4	1.33	1.53
	Redband Parrotfish	8	8	2	18	6.00	3.46
	Stoplight Parrotfish	10	4	4	18	6.00	3.46
	Striped Parrotfish	6	2	11	19	6.33	4.51
PUFFER	Balloonfish						
	Sharpnose Puffer	7	4	4	15	5.00	1.73
RAY	Southern Stingray						
SCORPIONFISH	Spotted Scorpionfish	1			1	0.33	0.58
SEABASS	Creolefish	1			1	0.33	0.58
	Harlequin Bass	9	10	3	22	7.33	3.79
SNAPPER	Tobaccofish						
	Grey Snapper						
	Schoolmaster	1		2	3	1.50	0.71
SQUIRRELFISH	Mahogany Snapper juv			20	20	20.00	
	Blackbar Soldierfish	3	7	16	26	8.67	6.66
	Squirrelfish	5	2	2	9	3.00	1.73
SURGEONFISH	Blue Tang	4	1	8	13	4.33	3.51
	Doctorfish	1	1		2	0.67	0.58
	Ocean Surgeon						
WRASSE	Bluehead Wrasse	23	87	20	130	43.33	37.85
	Clown Wrasse			1	1	0.33	0.58
	Creole Wrasse	77		3	80	26.67	43.62
	Rainbow Wrasse						
	Puddingwife		1		1	0.50	0.71
OTHERS	Yellowhead Wrasse	22	21	26	69	23.00	2.65
	Cornetfish						
	Hawkfish, Redspotted						
	Sand Diver		1		1	0.50	0.71
	Sand Tilefish						
TOTAL	Soapfish, Greater						
	Trumpetfish	4	3	1	8	2.67	1.53
TOTAL		1111	879	1280	3270	1090.00	
Invertebrates		Transect 1 Depth:12m	Transect 2 Depth: 6m	Transect 3 Depth:10m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone		1		1	1.00	1.00
	Corkscrew Anemone	2			2	1.00	1.00
	Giant Anemone	4	19	10	33	11.00	7.55
	Knobby Anemone	18	7	10	35	11.67	5.69
TUBE WORMS	Christmas tree Worms	152	409	199	760	253.33	136.84
	Ghost Feather Duster						
	Magnificent Feather Duster		3	5	8	2.67	2.52
	Social Feather Duster		1		1	0.50	0.71
	Split Crown Feather Duster	4	2	6	12	4.00	2.00
	Star Horseshoe Worm	1	4	5	10	3.33	2.12
CRUSTACEANS	Variagated Feather Duster	12	12	4	28	9.33	4.62
	Banded Coral Shrimp	1			1	0.50	0.71
	Hairy Clinging Crab						
	Pederson Cleaner Shrimp	22	8	7	37	12.33	8.39
MOLLUSKS	Red Snapping Cleaner Shrimp						
	Yellowline Arrow Crab	1			1	1.00	
	Atlantic Thorny Oyster		1		1	0.50	0.71
ECHINODERMS	Lettuce Sea Slug			2	2	1.00	1.41
	Queen Conch						
	Rough File Claw			1	1	0.33	0.58
TOTAL	Longspined Black Sea Urchir		2		2	1.00	1.41
TOTAL		217	469	244	930	310.00	

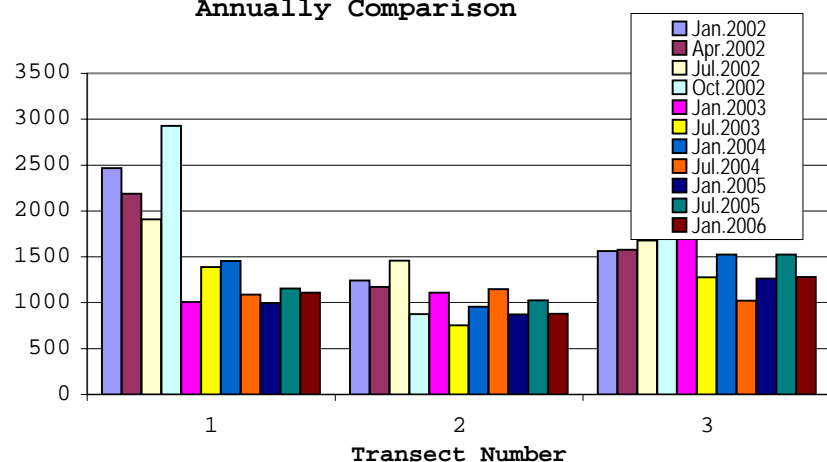
**PORTOMAREA MARINE MONITORING  
FISH AND INVERTEBRATE QUARTERLY/SEMI-ANNUALLY COMPARISON**

	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
<b>Fish</b>	2466	2187	1908	2929	1241	1173	1459	877	1562	1576	1677	1830
<b>Invertebrates</b>	556	384	314	406	537	596	724	731	432	334	403	187

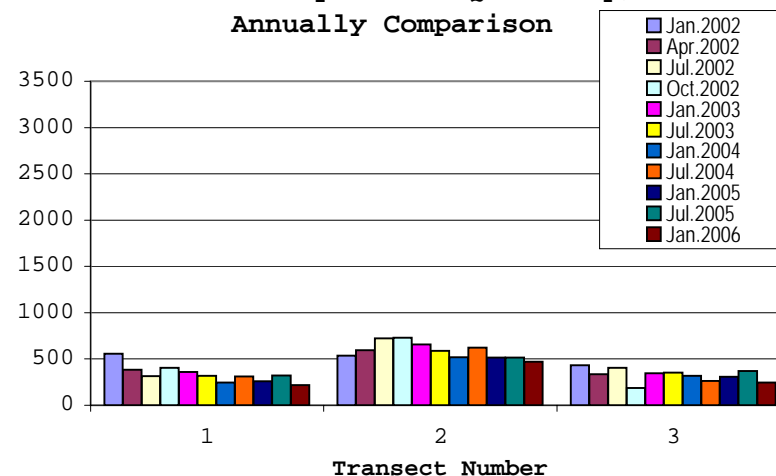
	Transect 1 - Depth 12m		Transect 2 - Depth 6m		Transect 3 - Depth 10m		Transect 1 - Depth 12m		Transect 2 - Depth 6m		Transect 3 - Depth 10m	
	Jan.2003	July 2003	Jan.2003	July 2003	Jan. 2003	July 2003	Jan.2004	July 2004	Jan.2004	July 2004	Jan. 2004	July 2004
<b>Fish</b>	1007	1390	1109	754	1767	1276	1454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

	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.2005	July 2005	Jan.2005	July 2005	Jan. 2005	July 2005	Jan.2006	July 2006	Jan.2006	July 2006	Jan.2006	July 2006
<b>Fish</b>	995	1154	873	1026	1262	1526	1111		879		1280	
<b>Invertebrates</b>	260	323	515	514	307	369	217		469		244	

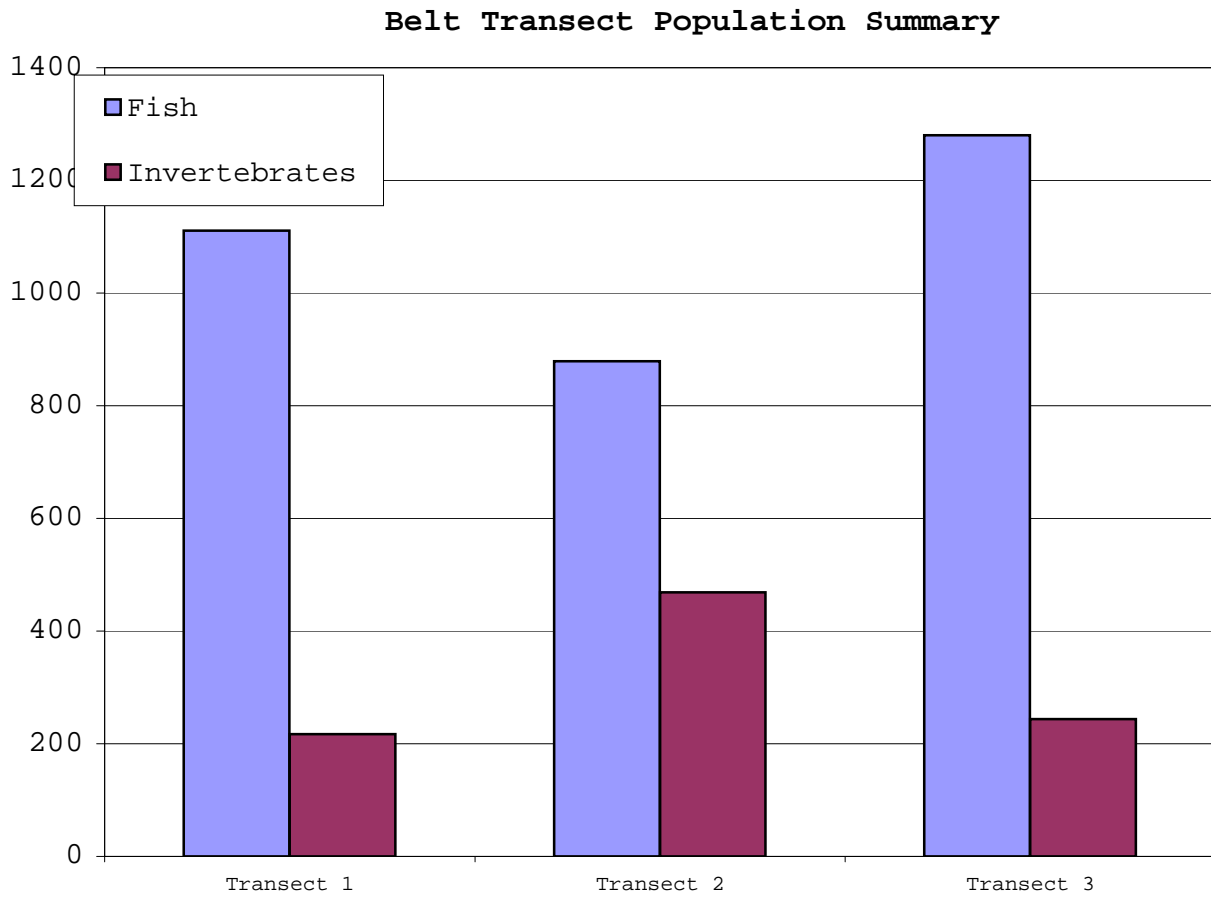
**Fish Population Quarterly/Semi-Annually Comparison**



**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: January 21-22, 2006

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	1				1	1	
	French Angelfish							
	Rock Beauty	1				1	1	
BASSLET	Fairy Basslet	2	6	1		9	3.00	2.65
BLENNY								
BOXFISH	Smooth Trunkfish		1			1	1.00	
	Honeycomb Cowfish							
BUTTERFLYFISH	Banded Butterflyfish		1	2		3	1.5	0.71
	Foureye Butterflyfish	3				3	3	
	Longsnout Butterflyfish			1		1	1.00	
CHROMIS	Blue Chromis	48	8	11	5	72	18.00	20.15
	Brown Chromis	175	50	34	118	377	94.25	64.99
DAMSELFISH	Bicolor	68	54	65	56	243	60.75	6.80
	Sergeant Major			1		1	1	
	Threespot	20	16	20	4	60	15.00	7.57
	Yellowtail							
DRUM	Spotted Drum	1				1	1	
EEL	Green Moray	1				1	1.00	
	Spotted Moray		2	1		3	1.5	0.71
FILEFISH	Scrawled Filefish							
	Whitespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Yellow Goatfish	2	3	2	10	17	4.25	3.86
	Spotted Goatfish							
GOBY	Bridled Goby	10	14	24	33	81	20.25	10.34
	Neon Goby							
	Peppermint Goby		3			3	3	
GROUPEL	Graysby	4	1	4	3	12	3.00	1.41
	Rock Hind							
GRUNT	Bluestriped Grunt							
	French Grunt	3			2	7	2.333333	0.58
	Smallmouth Grunt							
HAMLET	Barred Hamlet							
	Butter Hamlet			1		1	1	
	Yellowtail Hamlet		1	1	2	4	1.333333	0.58
HOGFISH	Spanish Hogfish		1			1	1.00	
JACK	Bar Jack							
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	10	4	4	8	26	6.5	3.00
	Queen Parrotfish							
	Redband Parrotfish	2	2	2	2	8	2.00	
	Stoplight Parrotfish	4	5		1	10	3.333333	2.08
PUFFER	Striped Parrotfish		3	1	2	6	2.00	1.00
	Balloonfish							
	Sharpnose Puffer	3	3	1		7	2.333333	1.15
SCORPIONFISH	Spotted Scorpionfish			1		1	1	
SEABASS	Creole Fish		1			1	1	
	Harlequin Bass	2	2	3	2	9	2.25	0.50
SNAPPER	Gray Snapper							
	Schoolmaster	1				1	1	
SQUIRRELFISH	Blackbar Soldierfish	2		1		3	1.50	0.71
	Squirrelfish	1	1	2	1	5	1.25	0.50
SURGEONFISH	Blue Tang	2	1		1	4	1.333333	0.58
	Doctorfish			1		1	1	
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	7	4		12	23	7.666667	4.04
	Clown Wrasse							
	Creole Wrasse			69	8	77	38.5	43.13
	Slippery Dick							
OTHERS	Yellowhead Wrasse	3	7	5	7	22	5.50	1.91
	Sand Diver							
	Soapfish,greater							
TOTAL	Trumpetfish	1		2	1	4	1.333333	0.58
TOTAL		377	194	262	278	1111	277.75	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Corkscrew Anemone	2				2	2.00	
	Giant Anemone	1	2	1		4	1.33	0.58
	Knobby Anemone	6	6	4	2	18	4.5	1.91
TUBE WORMS	Christmas tree Worms	53	31	21	47	152	38.00	14.65
	Ghost Feather Duster							
	Magnificent Feather Duster							
	Split Crown Feather Duster	1	3			4	2	1.41
	Star Horseshoe Worm				1	1	1	
CRUSTACEANS	Variegated Feather Duster	4		7	1	12	4.00	3.00
	Banded Coral Shrimp	1				1	1	
	Pederson Cleaner Shrimp	3	7	7	5	22	5.5	1.91
MOLLUSKS	Yellowline Arrow Crab		1			1	1	
	Rough File Clam							
	Queen Conch							
ECHINODERMS	Lettuce Sea Slug							
	Reef Urchin							
TOTAL		71	50	40	56	217	54.25	

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: January 17, 2006  
 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		1			1	1.00	
	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	2			4	2.00	
	Longsnout Butterflyfish							
CARDINALFISH								
CHROMIS	Blue Chromis			1	2	3	1.50	0.71
	Brown Chromis	46		100		146	73.00	38.18
DAMSELFISH	Bicolor Damselfish	67	189	73	90	419	104.75	57.01
	Cocoa Damselfish	5	1	5	5	16	4.00	2.00
	Dusky Damselfish	8	1	15	4	28	7.00	6.06
	Sergeant Major							
	Threespot Damselfish	1	3	11	3	18	4.50	4.43
	Yellowtail Damselfish			1		1	1.00	
DRUM	Spotted Drum				1	1	1.00	
EEL	Goldentail Moray							
	Spotted Moray			1		1	1.00	
FILEFISH	Orangespotted Filefish		1		1	2	1.00	
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish	1				1	1.00	
GOBY	Bridled Goby	13	1	15	5	34	8.50	6.61
	Neon Goby	2	3			5	2.50	0.71
	Peppermint Goby	2	4	10		16	5.33	4.16
GROUPEL	Coney	1	4		1	6	2.00	1.73
	Graysby			1	1	2	1.00	
GRUNT	Bluestriped Grunt							
	Ceasar Grunt				1	1	1.00	
	French Grunt	2	1		3	6	2.00	1.00
	Striped Grunt				1	1	1.00	
HAMLET	Barred Hamlet							
	Butter Hamlet							
	Yellowtail Hamlet				1	1	1.00	
HOGFISH	Spanish Hogfish							
JACK	Bar Jack							
MACKEREL	Cero							
PARROTFISH	Princess Parrotfish	2	3	2	2	9	2.25	0.50
	Queen Parrotfish		1			1	1.00	
	Redband Parrotfish	1	4	1	2	8	2.00	1.41
	Stoplight Parrotfish		2		2	4	2.00	
	Striped Parrotfish				2	2	2.00	
PUFFER	Balloonfish							
	Sharpnose Puffer	1		2	1	4	1.33	0.58
RAY								
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish							
	Harlequin Bass	4	4	1	1	10	2.50	1.73
	Tobaccofish							
SNAPPER	Schoolmaster							
SQUIRRELFISH	Blackbar Soldier			3	4	7	3.50	0.71
	Squirrelfish	1		1		2	1.00	
SURGEONFISH	Blue Tang		1			1	1.00	
	Doctorfish				1	1	1.00	
TRIGGERFISH	Black Durgon							
WRASSE	Bluehead Wrasse	26	35		26	87	29.00	5.20
	Clown Wrasse							
	Creole Wrasse							
	Puddingwife			1		1	1.00	
	Yellowhead Wrasse	6	11	1	3	21	5.25	4.35
OTHERS	Octopus							
	Lizardfish							
	Sand Diver			1		1	1.00	
	Sand Tilifish							
	Trumpetfish	1	2			3	1.50	0.71
<b>TOTAL</b>		<b>194</b>	<b>275</b>	<b>246</b>	<b>164</b>	<b>879</b>	<b>219.75</b>	
<b>Atlantic Belt Transect: Invertebrates</b>		<b>0-20m</b>	<b>25-45m</b>	<b>50-70m</b>	<b>75-100m</b>	<b>Total</b>	<b>Mean</b>	<b>St.Dev.</b>
ANEMONE	Carpet Anemone			1		1	1.00	
	Corkscrew Anemone				3	3	1.00	
	Giant Anemone	4	11	1		16	4.75	4.35
	Knobby Anemone	2	1	2	2	7	1.75	0.50
TUBE WORMS	Christmas tree Worms	138	31	118	122	409	102.25	48.28
	Ghost Feather Duster							
	Magnificent Feather Duster	1		2		3	1.50	0.71
	Social Feather Duster				1	1	1.00	
	Split Crown Feather Duster	1		1		2	1.00	
	Star Horseshoe Worm	2		2		4	2.00	
	Variegated Feather Duster	1	6	2	3	12	3.00	2.16
CRUSTACEANS	Banded Coral Shrimp							
	Pederson Cleaner Shrimp	1		6	1	8	2.67	2.89
	Yellowline Arrow Crab							
MOLLUSKS	Atlantic Thorny-oyster			1		1	1.00	
	Flamingo Tongue							
	Lettuce Sea Slug							
	Penn Shell							
	Queen Conch							
	Rough Fileclam							
ECHINODERMS	Longspined Black Sea Urchin		2			2	2.00	
<b>TOTAL</b>		<b>150</b>	<b>52</b>	<b>135</b>	<b>132</b>	<b>469</b>	<b>117.25</b>	

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: January 16, 2006

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							
	French Angelfish							
	Queen Angelfish							
BARRACUDA								
BASSLET	Fairy Basslet	3				3	3.00	
BIGEYE								
BLENNY								
BOXFISH	Honeycomb Cowfish							
	Smooth Trunkfish		1	2	1	4	1.33	0.58
BUTTERFLYFISH	Foureye Butterflyfish		2		2	4	2.00	
	Banded Butterflyfish							
	Longsnout Butterflyfish							
CHROMIS	Blue Chromis							
	Brown Chromis	105	150	200	60	515	128.75	60.05
	Sunshinefish							
DAMSELFISH	Beaugregory Damselfish							
	Bicolor Damselfish	91	116	72	44	323	80.75	30.41
	Cocoa Damselfish	3			2	5	2.50	0.71
	Dusky Damselfish	3		3	4	10	3.33	0.58
	Sergeant Major							
	Threespot Damselfish	9	3	5		17	5.67	3.06
YELLOWTAIL DAMSELFISH								
DRUM	Spotted Drum							
EEL	Goldentail Moray		1	1		2	1.00	
	Spotted Moray				1	1	1.00	
FILEFISH	Scrawled Filefish		1			1	1.00	
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish	3	2	8		13	4.33	3.21
GOBY	Bridled Goby	55	60	31	20	166	41.50	19.12
	Neon Goby		1			1	1.00	
	Peppermint Goby							
GROUPER	Coney	1	3	4	2	10	2.50	1.29
	Graysby	1	2	1	3	7	1.75	0.96
	Rock Hind							
	Tiger Grouper							
GRUNT	Bluestriped Grunt							
	French Grunt	1	1	4	1	7	1.75	1.50
	Striped Grunt	1	1		39	41	13.67	21.94
HAMLET	Barred Hamlet			1		1	1.00	
	Black Hamlet							
	Butter Hamlet							
	Yellowtail Hamlet	2				2	2.00	
HOGFISH	Spanish Hogfish	1	1		1	3	1.00	
JACK	Bar Jack	1	1			2	1.00	
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	8	1	4	3	16	4.00	2.94
	Queen Parrotfish	1	2			3	1.50	0.71
	Redband Parrotfish		1		1	2	1.00	
	Stoplight Parrotfish	1		3		4	2.00	1.41
	Striped Parrotfish		8	2	1	11	3.67	3.79
PUFFER	Sharpnose Puffer	1	2	1		4	1.33	0.58
RAY	Southern Stingray							
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creolefish							
	Harlequin Bass		1	1	1	3	1.00	
SNAPPER	Schoolmaster	1		1		2	1.00	
	Mahogany Snapper juv			20		20	20.00	
SQUIRRELFISH	Blackbar Soldierfish	15	1			16	8.00	9.90
	Squirrelfish			1	1	2	1.00	
SURGEONFISH	Blue Tang	2	3	2	1	8	2.00	0.82
	Doctorfish							
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	7	8	3	2	20	5.00	2.94
	Clown Wrasse		1			1	1.00	
	Creole Wrasse			3		3	3.00	
	Puddingwife							
	Slippery Dick							
	Yellowhead Wrasse	5	5	9	7	26	6.50	1.91
OTHERS	Soapfish							
	Trumpetfish		1			1	1.00	
<b>TOTAL</b>		<b>321</b>	<b>380</b>	<b>382</b>	<b>197</b>	<b>1280</b>	<b>320</b>	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone							
	Corkscrew Anemone							
	Giant Anemone	1	4	4	1	10	2.50	1.73
	Knobby Anemone	2		6	2	10	3.33	2.31
TUBE WORMS	Christmas tree Worm	70	40	52	37	199	49.75	14.97
	Ghost Feather Duster							
	Magnificent Feather Duster	2		1	2	5	1.67	0.58
	Social Feather Duster							
	Split Crown Feather Duster				6	6	6.00	
	Star Horseshoe Worm							
CRUSTACEANS	Variiegated Feather Duster	2		1	1	4	1.33	0.58
	Yelloline Arrow Crab							
ECHINODERMS	Pederson Cleaner Shrimp			4	3	7	3.50	0.71
	Longspined Black Sea Urchin							
MOLLUSKS	Flamingo Tongue							
	Rough File Clam	1				1	1.00	
	Lettuce Sea Slug	2				2	2.00	
<b>TOTAL</b>		<b>80</b>	<b>44</b>	<b>68</b>	<b>52</b>	<b>244</b>	<b>61</b>	

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 : January 19, 2006  
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	3	5,5	5,5	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						New coral growth on this ball
			Star Coral, smooth	SW	H		6	13	N	N	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		9	13	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						
			Sea Rod, white	SW	H	GONE						
			Staghorn coral	S	M	GONE						
			Staghorn coral		T	GONE						
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						
			Sea Rod, white	NW	M	GONE						
			Staghorn coral		T	GONE						
10R	7 O	0	No Plugs on this bal									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	16	21	21	Y	N	N	Position now SH
			Sea Rod, black	S	M	8	19	17	Y	N	N	Position now SWM, pointed downwards
			Sea Rod, white	E	H	130	23	44	Y	N	N	Position now SEH. Flamingo tongues damaged 34
			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						
<b>Subtotal</b>			<b>6 Number of live coral plugs</b>									
<b>Codes:</b>												
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 Fire coral on this ball
			Finger coral	NW	M-on oyster	GONE						
			Finger coral	NW	M	GONE						
			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. Algae
10 R	12 LP	1	Brain coral	NW	T		8	11	N	N	Y	Less Algae than last survey on Brain Co
			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		6	9	N	N	N	New coral growth on this ball
			Finger coral	N	M	LYING IN THE SAND, 27 BRANCHES						Fire coral on this ball
			Leaf coral ( Lettuce)	E	M	3	3	4	Y	N	N	12o'clock Dying? Position SEML in stead of SSEML 5 o'clock 8 o'clock Overgrown by Lumpy Overgrowing Sponge
			Leaf coral ( Lettuce)	NW	L	3	6	8	Y	N	N	
			Leaf coral ( Lettuce)	NE	M	6	6,5	8	Y	N	Y	
			Leaf coral ( Lettuce)	SE	M	1	7	9	Y	N	N	
			Leaf coral ( Lettuce)	SE	ML	GONE						
			Leaf coral ( Lettuce)	SSE	ML	3	6	7,5	Y	N	N	
			Leaf coral ( Lettuce)	SSE	L	OVERGROWN BY FIRE CORAL						
			Leaf coral ( Lettuce)	SE	M	GONE						
			Leaf coral ( Lettuce)	SW	ML	GONE						
			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	N	Y	N	New coral growth on this ball
			Brain coral	SE	H		4	6	N	N	N	
10R	16 B	1	Brain coral	NW	H		3,5	10	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
<b>Subtotal</b>			<b>10 Number of live coral plugs</b>									

**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
			Mustard hill	N	H	GONE						Fire coral on this ball
			Sea rod, white	NW	H	48	17	15,5	N	Y	Y	18 Branches damaged at base by Falmingo
			Sea rod, white	NW	M	13 left	19	17	N	Y	Y	Skeleton, 13 br left, Flamingo tongue da
			Finger coral	SW	H	GONE						This Ball moved, Ivan 9/2004
10R	24 P	1	Brain coral	NW	T	GONE						New coral growth on this ball
			Maze coral	SE	ML		1	10	Y	N	N	Fire coral on this ball
			Mustard hill	NE	M	DEAD						
			Sea rod, black	NW	T	GONE						
			Sea rod, black	SW	T	GONE						
			Staghorn coral	N	T	GONE						
			Staghorn coral		T	GONE						Found Broken off, placed on top of P 24
10R	25 B	0	Pencil coral	NW	M	GONE						New coral growth. Fire coral on this ball
10R	26 LP	1	Maze coral	W	T		7,5	10	Y	N	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 cora
			Sea Rod, white	W	T	> 150	28	35	Y	N	N	Flamingo tongue. Not damaged yet.
10R	28 P	0	Finger coral	SW	H	GONE						New coral growth on this ball
			Finger coral	NE	M	GONE						
			Flower coral	SE	H	GONE						Fire coral on this ball
			Leaf coral (lettuce)	SW	M	GONE						
			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										
<b>Subtotal</b>		<b>5</b>										
<b>Total</b>		<b>21 Number of live coral plugs</b>										

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

Date : January 13, 2006  
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		3	Leaf coral (lettuce)	NW	T		11	14	N	Y	Y	Encrusting Sponge on lettuce coral
				Pencil coral	NE	T	46	5	10	Y	N	N	
				Pencil coral	N	H	9	2	6	Y	Y	Y	
				Solitary Disk coral	N	L	DEAD						New coral growth on this ball.
				Staghorn coral	N	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	S	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	SW	T	FALLEN DOWN, ON SAND NEAR RB						
				Staghorn coral	NW	H	GONE						
				Staghorn coral	SE	H	GONE						Ivan 9/2004. In between Reef Balls
12L	2P		2	Pencil coral	NE	T	GONE						New coral growth on this ball
				Pencil coral	SW	T	DEAD						
				Pencil coral	SE	H	25	4	5,5	N	N	N	Xmas tree worm in this pencil coral
				Staghorn coral	NE	T	GONE						
				Staghorn coral	W	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	NW	T	69	41	47	N	Y	Y	Broken off at base. Lying on top of Reef
				Staghorn coral	NE	H	GONE						Staghorn spontaneous growth NT, 4 growl
				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						
				Staghorn coral	NW	H	GONE						Ivan 9/2004. In between Reef Balls
12L	5P		0	Finger coral	NE	T	GONE						Overgrown by fire coral
				Finger coral	NW	L	GONE						
				Staghorn coral	SE	T	GONE						New coral growth on this ball.
				Staghorn coral	SW	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	NW	T	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	N	H	GONE						
				Staghorn coral	SE	H	GONE						
				Staghorn coral	NE	H	GONE						Ivan 9/2004. In between Reef Balls
				Staghorn coral	SW	H	GONE						
				Staghorn coral	WSW	H	GONE						
				Staghorn coral	NE	T	GONE						Ivan 9/2004. In between Reef Balls
<b>Total</b>				<b>5 Number of live coral plugs</b>									

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

Date : January 13, 2006  
Observer: Marjo van den Bulck

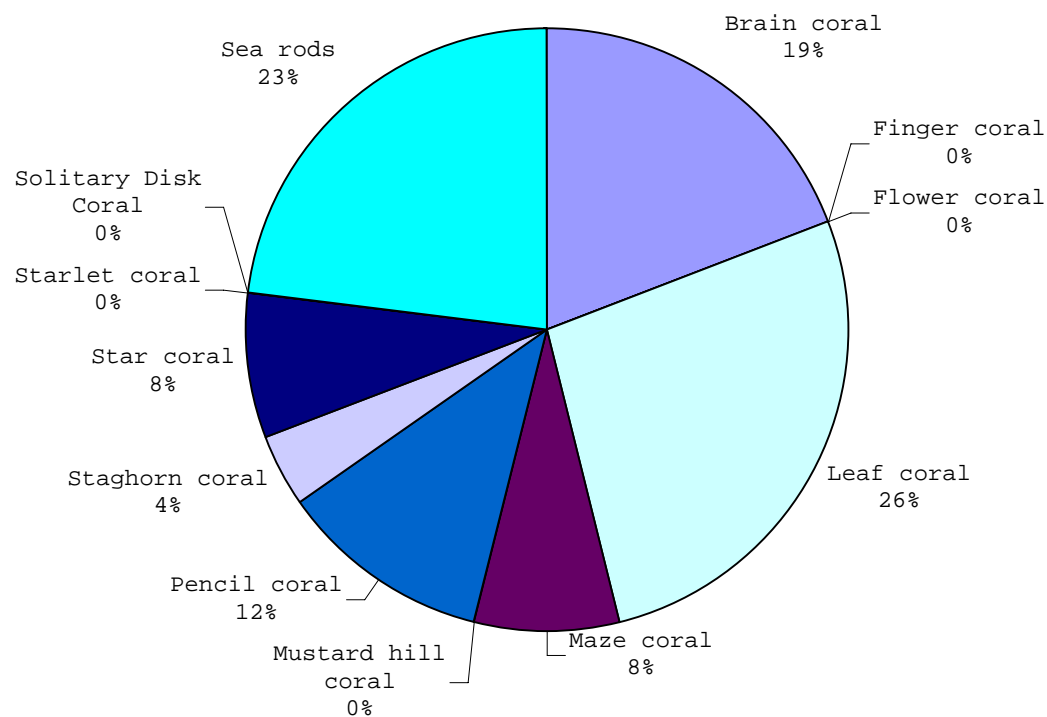
CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				direction	height							
18L	1LP	2	Sea Rod, black	N	T	13	26	26	Y	N	N	New coral growth on this ball.
			Pencil coral	SE	M	31	5,5	8	N	N	N	
18L	2B	2	Flower coral	W	T	38 cups	6	11	N	N	N	New coral growth on this ball.Plug unsta 6 living pieces
			Finger coral	SE	M	mall tips	1,5	3	N	N	N	
18L	3B	1	Sea Rod, black	SW	T	4	10	9	N	Y	N	New coral growth on this ball.
			Leaf coral ( Lettuce)	W	H	GONE						
			Pencil coral	NE	H	GONE						
18L	4LP	2	Sea Rod, black	NE	T	6	8	14	N	N	N	Base overgrown.
			Pencil coral	SE	M	19	3	6	N	N	N	New coral growth on this ball.
18L	5B	2	Star coral	SE	T		3	7	Y	N	N	New coral growth on this ball.
			Sea Rod, white	SW	H	> 250	36	36	Y	N	N	
			Leaf Coral ( Lettuce)	NW	H	GONE						
18L	6P	2	Leaf coral ( Lettuce)	E	T	6	4,5	6,5	N	N	N	New coral growth on this ball.
			Star coral	SW	T		5	8	Y	N	N	
18L	7P	2	Maze coral	E	T		8	14	N	N	N	New coral growth on this ball.
			Star coral	W	T		4	8	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	3	2	4	N	N	N	
			Leaf coral ( Lettuce)	SW	H	GONE						
18L	11LP	0										
18L	120	0										
<b>Total</b>			<b>15 Number of live coral plugs</b>									



**PORTOMAREA MARINE MONITORING  
REEF BALL CORAL PLUG SPECIES SUMMARY**

**SPECIES DISTRIBUTION OF CORAL PLUGS ON REEF BALLS AS OF JANUARY 2006  
CLUSTER 10 WEST/RIGHT, CLUSTER 12 EAST/LEFT**

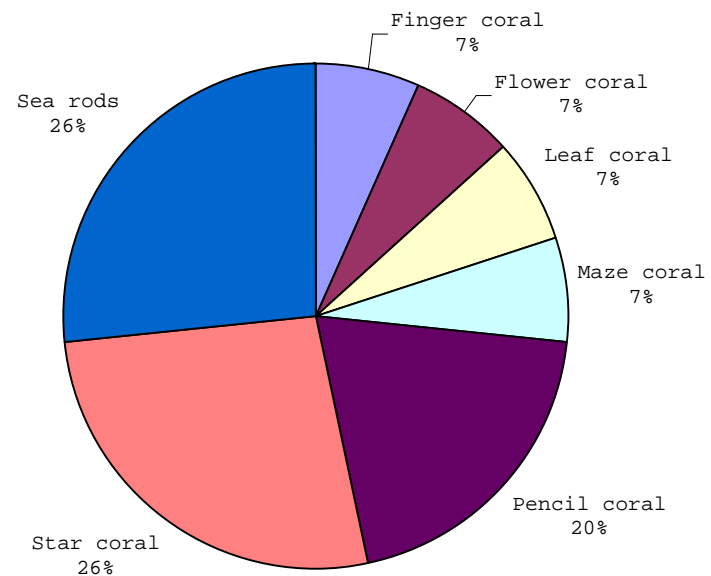
Coral Species	Number of Live Plugs	% of Total
Brain coral	5	19.23
Finger coral	0	0.00
Flower coral	0	0.00
Leaf coral	7	26.92
Maze coral	2	7.69
Mustard hill coral	0	0.00
Pencil coral	3	11.54
Staghorn coral	1	3.85
Star coral	2	7.69
Starlet coral	0	0.00
Solitary Disk Coral	0	0.00
Sea rods	6	23.08
black	2	
purple	0	
white	4	
<b>TOTAL</b>	<b>26</b>	<b>100</b>



PORTOMAREA MARINE MONITORING  
REEF BALL CORAL PLUG SPECIES SUMMARY

SPECIES DISTRIBUTION OF CORAL PLUGS ON REEF BALLS AS OF JANUARY 2006  
CLUSTER 18 EAST/LEFT

Coral Species	Number of Live Plugs		% of Total
Finger coral		1	6.67
Flower coral		1	6.67
Leaf coral		1	6.67
Maze coral		1	6.67
Pencil coral		3	20.00
Star coral		4	26.67
Sea rods		4	26.67
	black	3	
	white	1	
<b>TOTAL</b>		<b>15</b>	<b>100</b>



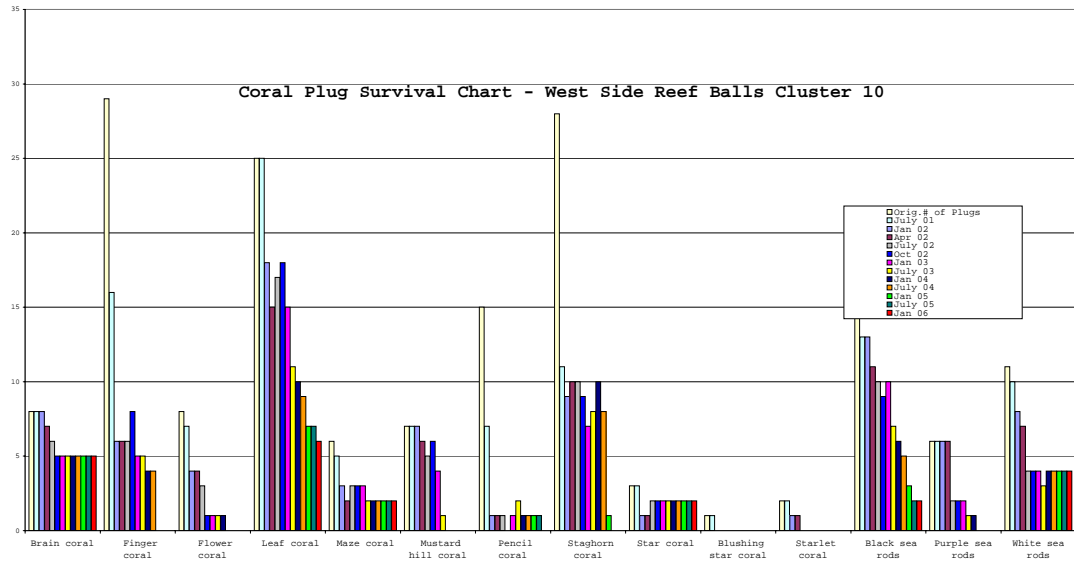
Coral Plug Survival Summary  
West Side Reef Balls, Cluster 10

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%

Coral Species	January 2006 Monitoring		July 2006 Monitoring	
	Number of Live Plugs	Mortality 57 months	Number of Live Plugs	Mortality 63 months
Brain coral*	5	38%		
Finger coral	0	100%		
Flower coral	0	100%		
Leaf coral	6	76%		
Maze coral	2	67%		
Mustard hill coral*	0	100%		
Pencil coral	0	100%		
Staghorn coral	0	100%		
Star coral	2	33%		
Blushing star coral	0	100%		
Starlet coral	0	100%		
Sea rods black	2	87%		
Sea rods purple	0	100%		
Sea rods white	4	64%		
TOTALS	21	87%	0	

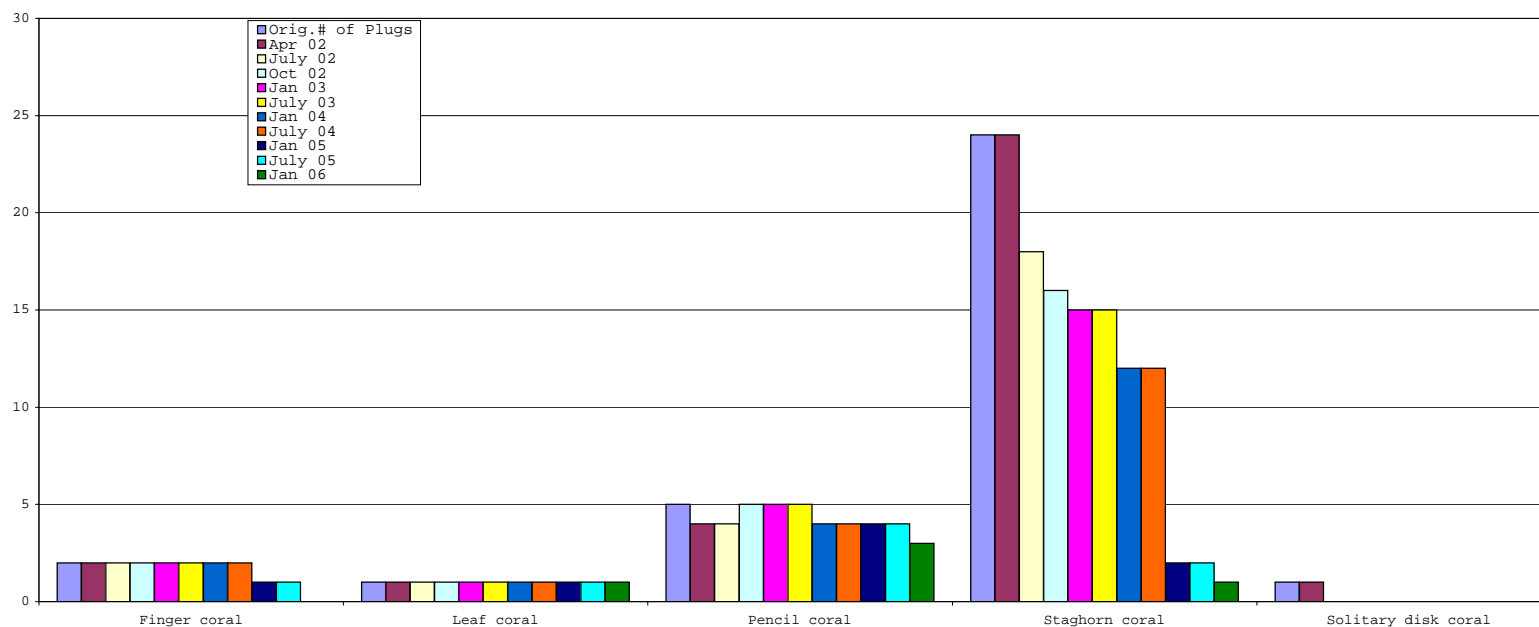


PORTOMAREA MARINE MONITORING  
Coral Plug Survival Summary  
East Side Reef Balls, Cluster 12

		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	
<b>TOTALS</b>	<b>33</b>	<b>32</b>	<b>3%</b>	<b>25</b>	<b>24%</b>	<b>24</b>	<b>27%</b>	<b>23</b>	<b>30%</b>	<b>23</b>	<b>30%</b>

		January 2004 Monitoring		July 2004 Monitoring		January 2005 Monitoring		July 2005 Monitoring		January 2006 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	Number of Live Plugs	Mortality 45.5 months
Finger coral	2	2	0%	2	0%	1	50%	1	50%	0	100%
Leaf coral	1	1	0%	1	0%	1	0%	1	0%	1	0%
Pencil coral	5	4	20%	4	20%	4	20%	4	20%	3	40%
Staghorn coral	24	12	50%	12	50%	2	92%	2	92%	1	96%
Solitary disk coral	1	0	100%	0	100%	0	100%	0	100%	0	100%
		Mean		Mean		Mean		Mean		Mean	
<b>TOTALS</b>	<b>33</b>	<b>19</b>	<b>42%</b>	<b>19</b>	<b>42%</b>	<b>8</b>	<b>76%</b>	<b>8</b>	<b>76%</b>	<b>5</b>	<b>85%</b>

Coral Plug Survival Chart East Side Reef Balls Cluster 12

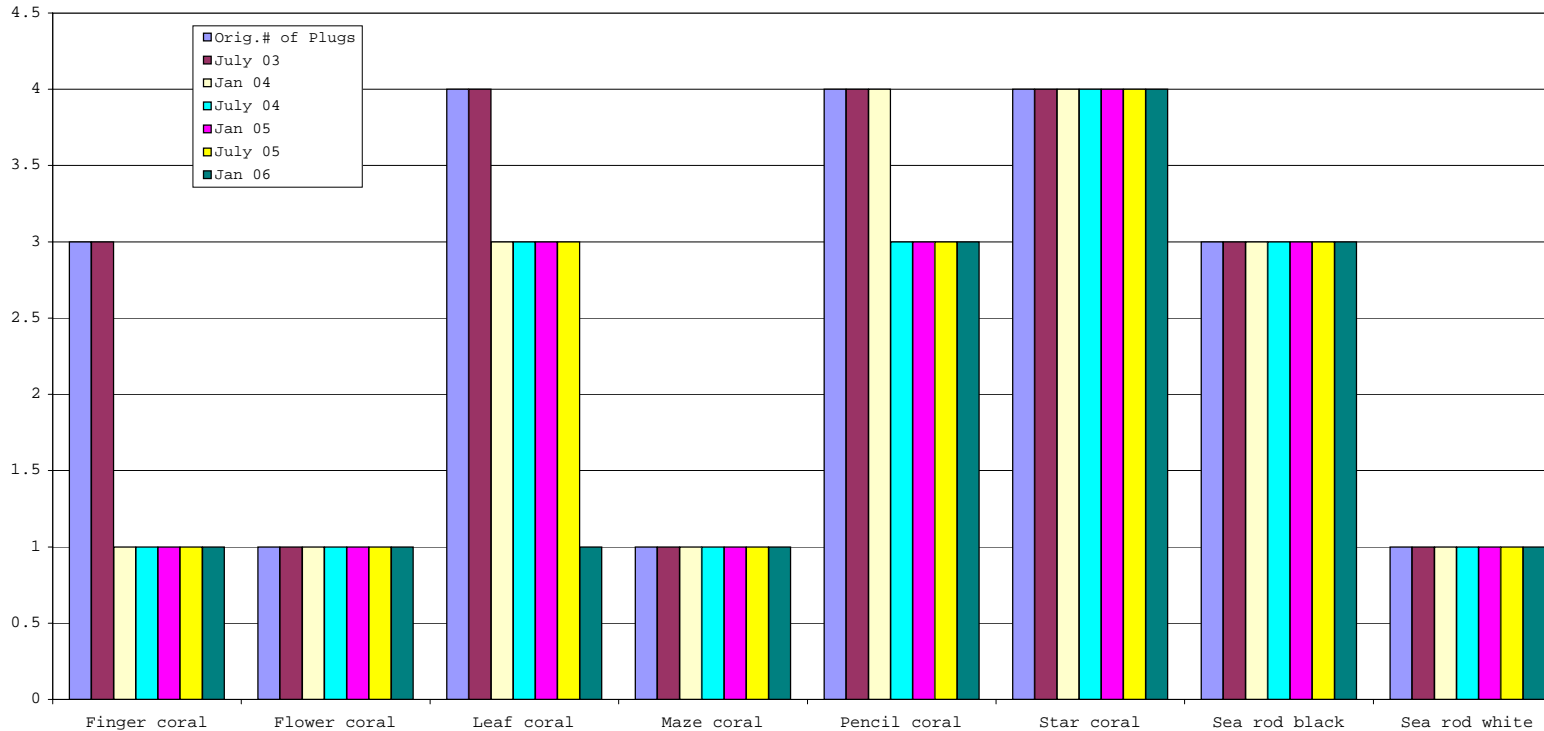


PORTOMAREA MARINE MONITORING

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		January 2006 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	Number of Live Plugs	Mortality 32 months
Finger coral	3	3	0%	1	67%	1	67%	1	67%	1	67%	1	67%
Flower coral	1	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%
Leaf coral	4	4	0%	3	25%	3	25%	3	25%	3	25%	1	75%
Maze coral	1	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%
Pencil coral	4	4	0%	4	0%	3	25%	3	25%	3	25%	3	25%
Star coral	4	4	0%	4	0%	4	0%	4	0%	4	0%	4	0%
Sea rod black	3	3	0%	3	0%	3	0%	3	0%	3	0%	3	0%
Sea rod white	1	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%
<b>TOTALS</b>	<b>21</b>	<b>21</b>	<b>Mean 0%</b>	<b>18</b>	<b>Mean 14%</b>	<b>17</b>	<b>Mean 19%</b>	<b>17</b>	<b>Mean 19%</b>	<b>17</b>	<b>Mean 19%</b>	<b>15</b>	<b>Mean 29%</b>

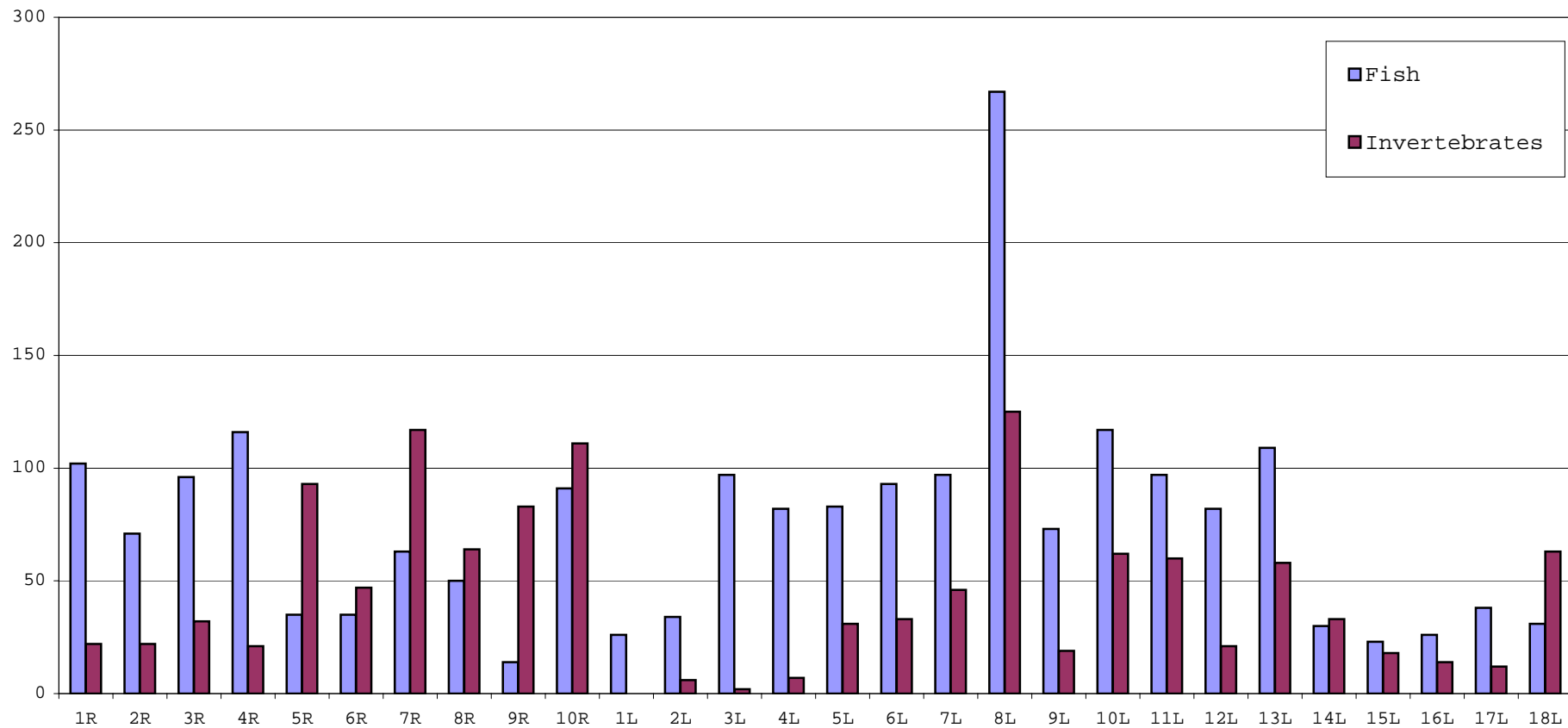
Coral Plug Survival Chart East Side Reef Balls Cluster 18



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

<b>Cluster No.</b>	<b>No.of Fish</b>	<b>% of Total</b>	<b>No.of Invertebrates</b>	<b>% of Total</b>
1R	102	4.91	22	1.80
2R	71	3.42	22	1.80
3R	96	4.62	32	2.62
4R	116	5.58	21	1.72
5R	35	1.68	93	7.61
6R	35	1.68	47	3.85
7R	63	3.03	117	9.57
8R	50	2.41	64	5.24
9R	14	0.67	83	6.79
10R	91	4.38	111	9.08
1L	26	1.25	0	0.00
2L	34	1.64	6	0.49
3L	97	4.67	2	0.16
4L	82	3.95	7	0.57
5L	83	3.99	31	2.54
6L	93	4.48	33	2.70
7L	97	4.67	46	3.76
8L	267	12.85	125	10.23
9L	73	3.51	19	1.55
10L	117	5.63	62	5.07
11L	97	4.67	60	4.91
12L	82	3.95	21	1.72
13L	109	5.25	58	4.75
14L	30	1.44	33	2.70
15L	23	1.11	18	1.47
16L	26	1.25	14	1.15
17L	38	1.83	12	0.98
18L	31	1.49	63	5.16
<b>TOTAL</b>	<b>2078</b>	<b>100</b>	<b>1222</b>	<b>100.00</b>

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



PORTOMAREA MARINE MONITORING

FISH and INVERTEBRATE SURVEY - REEF BALL CLUSTERS WEST

DATE: January 5 , 2006

TIME: 8.35 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			
FISH												Total	Mean	St.Dev.
ANGELFISH	French Angelfish	1					1				1	3	1.00	
BASSLET	Fairy Basslet													
BLENNY	Redlip Blenny	2	2	2								6	2.00	
	Spinyhead Blenny						1	1	1			3	1.00	
BOXFISH	Smooth Trunkfish													
BUTTERFLYFISH	Banded Butterflyfish				2							2	2.00	
	Foureye Butterflyfish										2	2	2.00	
CARDINALFISH	Belted Cardinalfish													
CHROMIS	Blue Chromis													
	Brown Chromis	15	13	20			12	35	5		30	130	18.57	10.60
DAMSELFISH	Beaugregory	5	1	3	8	5		2	2	1	2	29	3.22	2.33
	Bicolor Damselfish	5	9	15	12	4	6		5		9	65	8.13	3.87
	Cocoa Damselfish			4	4							8	4.00	
	Dusky Damselfish	3	3	2	1	4	2	4		3	13	35	3.89	3.55
	Sergeant Major	26		7		3			1		1	38	7.60	10.57
	Threespot Damselfish		3	3								6	3.00	
	Yellowtail Damselfish			1	3	4		2			1	11	2.20	1.30
DRUM	Spotted Drum													
EEL	Chain Moray													
	Spotted Moray			1								1	1.00	
FILEFISH	Orangespotted Filefish			1								1	1.00	
	Whitespotted Filefish							1			1	2	1.00	
FLOUNDER	Peacock Flounder													
GOATFISH	Spotted Goatfish													
	Yellow Goatfish				1					2		3	1.50	0.71
GOBY	Bridled Goby	2	6	3	11		2	3	30	4		61	7.63	9.52
	Neon Goby													
GROUPER	Coney					7	1	1	1		2	12	2.40	2.61
	Graysby													
	Rock Hind													
GRUNT	Bluestriped Grunt													
	French Grunt	10			1	2	1	1	1		2	18	2.57	3.31
	Smallmouth Grunt						1	1			1	3	1.00	
	White Grunt													
	Ceasar Grunt			2								2	2.00	
HAMLET	Yellowtail Hamlet													
HOGFISH	Spanish Hogfish													
JACK	Bar Jack													
	Palometa	13										13	13.00	
PARROTFISH	Blue Parrotfish													
	Princess Parrotfish			1	7	2		1			5	16	3.20	2.68
	Queen Parrotfish	1			1	1	1			1	2	7	1.17	0.41
	Redband Parrotfish		1	1							1	3	1.00	
	Stoplight Parrotfish													
PUFFER	Striped Parrotfish													
	Sharpnose Puffer						1					1	1.00	
	Porcupine													
SCORPIONFISH	Spotted Scorpionfish													
SEABASS	Harlequin Bass													
SNAPPER	Gray Snapper	1	2			1	2					6	1.50	0.58
	Yellowtail Snapper													
	Mutton Snapper													
SQUIRRELFISH	Blackbar Soldierfish						4	9		2	11	26	6.50	4.20
	Squirrelfish									1	2	3	1.50	0.71
SURGEONFISH	Blue Tang													
	Doctorfish		1	1	5							7	2.33	2.31
	Ocean Surgeonfish													
WRASSE	Bluehead Wrasse	8	16	27	44							95	23.75	15.59
	Clown Wrasse	1	1		2							4	1.33	0.58
	Puddingwife	1			1							2	1.00	
	Rainbow Wrasse													
	Slippery Dick	7	12	2	13				3			37	7.40	5.03
	Yellowhead Wrasse						1	1	1		1	4	1.00	
OTHERS	Lizardfish, Bluestriped													
	Mojarra, Yellowfin		1									1	1.00	
	Soapfish, Greater	1				1		1			3	6	1.00	1.00
	Trumpetfish											1	1.00	
<b>TOTAL</b>		<b>102</b>	<b>71</b>	<b>96</b>	<b>116</b>	<b>35</b>	<b>35</b>	<b>63</b>	<b>50</b>	<b>14</b>	<b>91</b>	<b>673</b>	<b>67.3</b>	

INVERTEBRATES												Total	Mean	St.Dev.	
ANEMONE	Corkscrew Anemone		1						1		2	1	5	1.25	0.50
	Knobby Anemone		1									1	1.00		
	Giant Anemone	1		1				5	3		1	5	16	2.67	1.97
ENCHINODERMS	Pencil Urchin														
	Rock Boring Urchin	2										2	2.00		
	Longspined Sea Urchin	4	1	2	1	2						10	2.00	1.22	
CRUSTACEANS	Banded Coral Shrimp				2							2	2.00		
	Pederson Cleaner Shrimp								1			1	1.00		
	Nimble Spray Crab	1		1	2							4	1.33	0.58	
	Yellowline Arrow Crab				1							1	1.00		
TUBE WORMS	Christmas Tree Worm	10	16	25	12	81	36	96	49	59	84	468	46.80	32.03	
	Ghost Feather Duster														
	Magnificent Feather D.														
	Split Crown Feather D.									3	1	4	2.00	1.41	
	Star Horseshoe Worm					1	1	1	6	5	3	17	2.83	2.23	
	Variegated Feather D.						1	11	5	8	8	33	6.60	3.78	
MOLLUSKS	Amber Penshell					3					1	4	2.00	1.41	
	Atlantic Thorny Oyster						1					1	1.00		
	Flamingo Tongue										3	3	3.00		
SPONGES	Lumpy Overgrowing Sponge	4	3	3	3	6	3	4	4	4	6	40	4.00	1.15	
<b>TOTAL</b>		<b>22</b>	<b>22</b>	<b>32</b>	<b>21</b>	<b>93</b>	<b>47</b>	<b>117</b>	<b>64</b>	<b>83</b>	<b>111</b>	<b>612</b>	<b>61.2</b>		

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: January 6, 2006

TIME: 08:20 a.m.

Data collected and recorded by: Marjo van den Bulck

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	FISH	1.5m	1.5m	1.6m	1.6m	2.1m	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				
ANGELFISH	French Angelfish																						
	Queen Angelfish																						
BLENNY	Redlip Blenny																				1	1.00	
	Saddled Blenny				1																		
	Spiny Head Blenny																						
BOXFISH	Smooth Trunkfish								1										1		2	1.00	
	Spotted Trunkfish				1						1								1		3	1.00	
BUTTERFLYFISH	Banded Butterflyfish				2			1		2											5	1.67	0.58
	Foureye Butterflyfish																						
CARDINALFISH	Belted Cardinalfish							1													1	1.00	
CHROMIS	Brown Chromis			34	16	55	9	6	60	20	30	34	36	34	2						336	28.00	18.24
DAMSELFISH	Beaugregory Damselfish	4		7	3	1	5	3	9	3	3	1	1	2				6			48	3.69	2.46
	Bicolor Damselfish		4	12	17	2	5	5	9	5	30	11	9	20	3				5	1	138	9.20	7.91
	Cocoa Damselfish	1	3	1																	5	1.67	1.15
	Dusky Damselfish	3		1	1	3		2	3	2			3								18	2.25	0.89
	Sergeant Major				2	8	2	2	7	13	24	2	8	1	3	2	2				76	5.85	6.53
	Threespot Damselfish																						
	Yellowtail Damselfish					4	2		3		1										10	2.50	1.29
EEL	Goldentail Moray								1			1									2	1.00	
FILEFISH	Orangespotted Filefish			1							1				1						3	1.00	
	Scrawled Filefish																						
FLOUNDER	Peacock Flounder											1									1	1.00	
GOATFISH	Spotted Goatfish																						
	Yellow Goatfish						1		2					8			1				12	3.00	3.37
GOBY	Bridled Goby	1	1	3		2	4	10	10		7	12	10	20	12	15	10	14	16		147	9.19	5.74
	Neon Goby																						
GROUPE	Coney			1	1	2			4	1	2		3	1					1	1	17	1.70	1.06
	Graysby		1																		1	1.00	
	Red Hind																						
GRUNT	Ceasar Grunt							3	1	1						1	1	1	1		9	1.29	0.76
	French Grunt	1	2	2	7	1	1	1	13	1		1	2		1		1				151	12.58	37.33
	Juvenile Grunt U.I.																						
HAMLET	Butter Hamlet																						
HOGFISH	Spanish Hogfish																		1		1	1.00	
JACK	Bar Jack				1																1	1.00	
PARROTFISH	Princess Parrotfish	1	1		5	1			3		4	2		2	5				3	7	34	3.09	1.97
	Queen Parrotfish			1	1		1		2	2			2	2					1		12	1.50	0.53
	Redband Parrotfish				2			1		1							2			1	7	1.40	0.55
	Redtail Parrotfish																				1	1.00	
	Stoplight Parrotfish												1	2							3	1.50	0.71
	Striped Parrotfish																						
PUFFER	Balloonfish			1																	1	1.00	
	Porcupine									1											1	1.00	
	Sharpnose Puffer													1				1			2	1.00	
SCORPIONFISH	Spotted Scorpionfish	1																			1	1.00	
SEABASS	Harlequin Bass													1							1	1.00	
SNAPPER	Gray Snapper	2	1	1														1			5	1.25	0.50
	Mutton Snapper			1																	1	1.00	
	Schoolmaster																						
SQUIRRELFISH	Squirrelfish			1	1	1			1			1	1	1							7	1.00	
SURGEONFISH	Blue Tang		4	3	9		4	3	1			1	1								26	3.25	2.66
	Doctorfish									1	11	7		4	2	3	2				32	4.00	3.38
	Ocean Surgeonfish																						
WRASSE	Bluehead Wrasse	4	7	20	12	2	50	30	16	9		16		10					7		183	15.25	13.36
	Clown Wrasse	2	1	1	1			2													7	1.40	0.55
	Puddingwife		1	1				2	2		1			1							8	1.33	0.52
	Slippery Dick	6	8	4			7	26			11		6								68	9.71	7.50
	Yellowhead Wrasse												3				1		2		6	2.00	1.00
OTHERS	Mojarra, Yellowfin																						
	Sand Diver																						
	Soapfish, Greater					1			1		2	1	2								8	1.33	0.52
	Trumpetfish						1				1										2	1.00	
<b>TOTAL</b>		<b>26</b>	<b>34</b>	<b>97</b>	<b>82</b>	<b>83</b>	<b>93</b>	<b>97</b>	<b>267</b>	<b>73</b>	<b>117</b>	<b>97</b>	<b>82</b>	<b>109</b>	<b>30</b>	<b>23</b>	<b>26</b>	<b>38</b>	<b>31</b>	<b>1405</b>	<b>78.06</b>		
<b>INVERTEBRATES</b>																				<b>Total</b>	<b>Mean</b>	<b>St. Dev.</b>	
ANEMONE	Corkscrew Anemone					3			1											1	5	1.7	1.15
	Giant Anemone		1	1	1	7	1	1	7	4	1	1	2	6	1				3		37	2.6	2.37
	Knobby Anemone		1						1												2	1.0	
CRUSTACEANS	Banded Coral Shrimp																						
	Nimble Spray Crab				1	1	1	1		1											5	1.0	
	Pederson Cleaner Shrimp																						
	Spotted Cleaner Shrimp													2							2	2.0	
SEGM. WORMS	Bearded Fireworm																						
	Christmas Tree Worm					15	22	36	111	12	46	53	15	43	25	15	10	7	53		463	33.1	27.69
	Ghost Feather Duster																						
	Star Horse Shoe Worm											4	4								8	4.0	
	Variegated Fth.Dstr.						2				10			1							13	4.3	4.93
MOLLUSKS	Amber Penshell								1												1	1.0	
	Atlantic Thorny Oyster																						
	Lettuce Sea Slug																						
	Spiny File Clam																						
SPONGES	Lumpy Overgrowing Sponge			1		1		1		1	1	2	3	7	6	3	4	1	8		39	3.0	2.52
ECHINODERMS	Pencil Urchin		2		1																3	1.5	0.71
	Longspined Black Sea Urchin		1		4	4	7	5	4	1			1						1	1	29	2.9	2.18
	Rock Boring Urchin		1					2													3	1.5	0.71
<b>TOTAL</b>		<b>6</b>	<b>2</b>	<b>7</b>	<b>31</b>	<b>33</b>	<b>46</b>	<b>125</b>	<b>19</b>	<b>62</b>	<b>60</b>	<b>21</b>	<b>58</b>	<b>33</b>	<b>18</b>	<b>14</b>	<b>12</b>	<b>63</b>	<b>610</b>	<b>33.89</b>			

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