

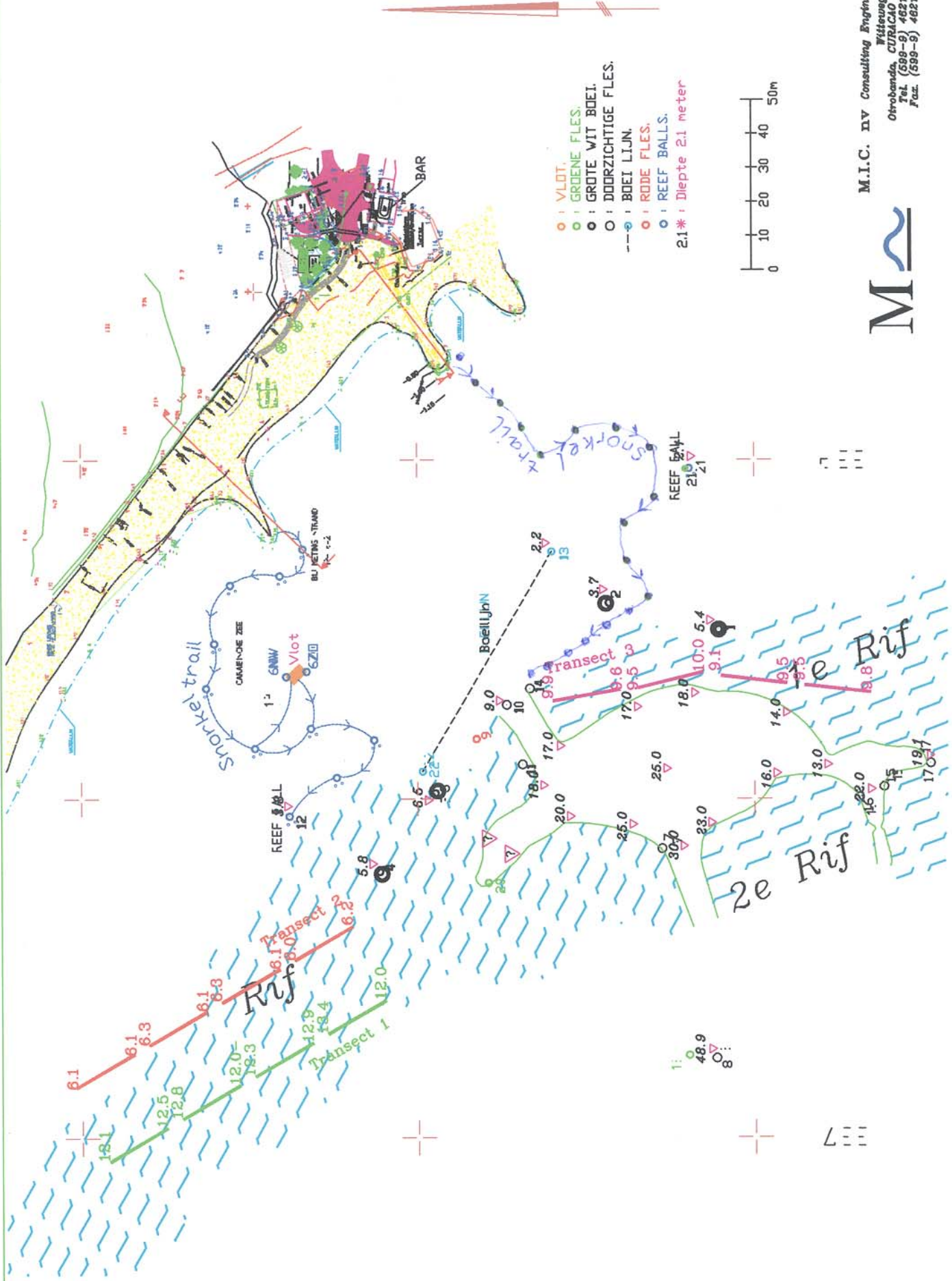
# **PORTOMAREA MARINE MONITORING**

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

by

Marjo van den Bulck

July 2004



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

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# PORTOMAREA MARINE MONITORING

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## **PORTOMAREA MARINE MONITORING**

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

Survey dates: June 27 - July 18, 2004.  
Data observed and recorded by: Marjo van den Bulck

During 2004 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 27C during this monitoring period.

Visibility varied from 15m to 30m. Average visibility 20m.

This period there was hardly any current.

### **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, four 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.

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, and the high percentage of sand cover reflects between coral patches. More than average algae growth on this transect.

### Damage

Signs of recent damage, e.g. broken hard corals, were not recorded during this monitoring period.

## **FISH/INVERTEBRATE SURVEY**

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

Cesar Grunts seen during this monitoring period.

## **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 of the Reef Balls show new coral growth. Especially on the west side of the bay new coral growth is clearly visible.

## **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.

## **FISH/INVERTEBRATE SURVEY - OBSERVATIONS**

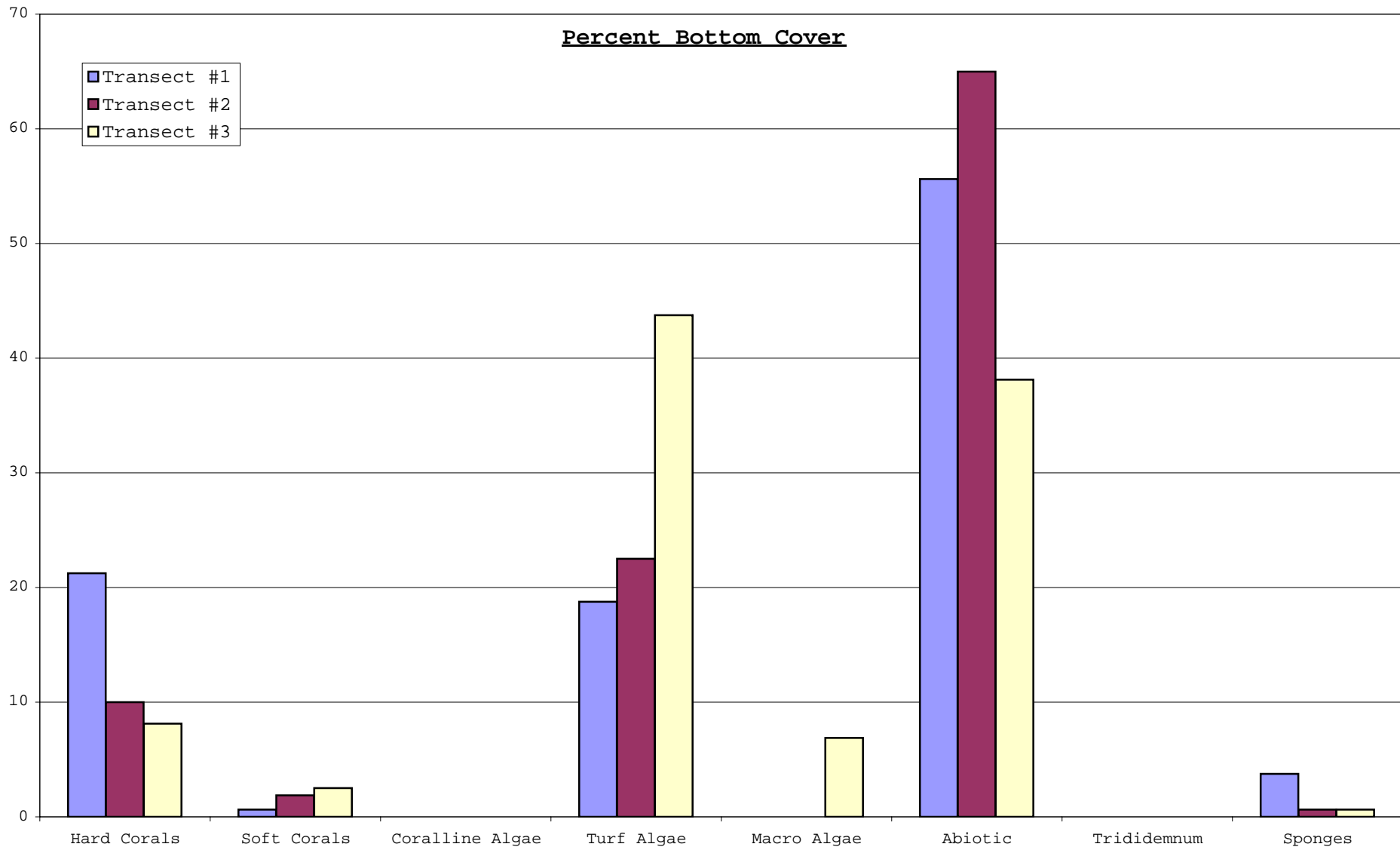
A small school of Grey Snappers was seen on Cluster 18 east during this survey period.

**PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY**

Date : July 2004  
Observer: Marjo van den Bulck

Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididem-num	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
1	12m														
	0-20m	9	9	0	0	0	0	0	0	3	0	26	0	2	40
	25-45m	14	14	0	0	0	0	0	0	10	0	13	0	3	40
	50-70m	5	5	0	0	0	0	1	0	10	0	24	0	0	40
	75-95m	6	6	0	0	0	0	0	0	7	0	26	0	1	40
	Mean	9	9	0	0	0	0	0	0	8	0	22	0	2	40
	% cover	21	100	0	0	0	0	1	0	19	0	56	0	4	100
	standard deviation	4,04	4,04	0,00	0,00	0,00	0,00	0,50	0,00	3,32	0,00	6,24	0,00	1,29	0,00
Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididem-num	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
2	6m														
	0-20m	5	5	0	0	0	0	0	0	2	0	33	0	0	40
	25-45m	2	2	0	0	0	0	0	0	13	0	25	0	0	40
	50-70m	5	5	0	0	0	0	1	0	10	0	23	0	1	40
	75-95m	4	4	0	0	0	0	2	0	11	0	23	0	0	40
	Mean	4	4	0	0	0	0	1	0	9	0	26	0	0	40
	% cover	10	100	0	0	0	0	2	0	23	0	65	0	1	100
	standard deviation	1,41	1,41	0,00	0,00	0,00	0,00	0,96	0,00	4,83	0,00	4,76	0,00	0,50	0,00
Transect No.	Depth	Hard Corals						Soft Corals	Coralline Algae	Turf Algae	Macro-Algae	Abiotic (Sand)	Trididem-num	Sponges	Total
		Total	Healthy	(Prt)Dead	Sick	Broken	Bleached								
3	10m														
	0-20m	10	10	0	0	0	0	1	0	12	4	13	0	0	40
	25-45m	1	1	0	0	0	0	3	0	18	1	17	0	0	40
	50-70m	0	0	0	0	0	0	0	0	19	6	14	0	1	40
	75-95m	2	2	0	0	0	0	0	0	21	0	17	0	0	40
	Mean	3	3	0	0	0	0	1	0	18	3	15	0	0	40
	% cover	8	100	0	0	0	0	3	0	44	7	38	0	1	100
	standard deviation	4,57	4,57	0,00	0,00	0,00	0,00	1,41	0,00	3,87	2,75	2,06	0,00	0,50	0,00

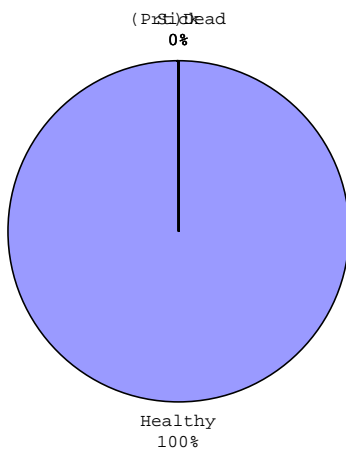
PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY



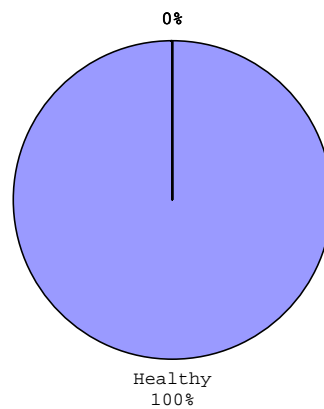


PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECTS - CORAL HEALTH CHART

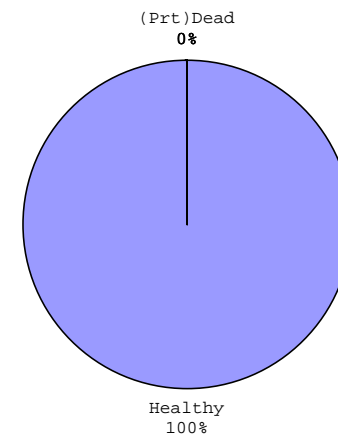
Transect 1, Depth 12m



Transect 2, Depth 6m



Transect 3, Depth 10m



PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECT

Transect No: 1, Depth 12m, Section 0-20m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: July 9, 2004      Temperature: 227C

M	HARD CORALS								CONDITION/REMARKS				SOFT CORALS					
	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																	SD	
2					Finger				Healthy									
2,5			Boulder						Healthy									
3																	RC	
3,5						Lettuce			Healthy									
4			Boulder						Healthy									
4,5			Boulder						Healthy									
5																	SD	
5,5			Boulder						Healthy									
6																	SD	
6,5																	SD	
7																	RC	
7,5																	RB	
8																	SD	
8,5																	RB	
9																	RB	
9,5																	RB	
10																	RC	
10,5																	RC	
11																	SD	
11,5																	SD	
12																	RC	
12,5																	RC	
13								Flower	Healthy									
13,5																YA		
14																	RC	
14,5																YA		
15																	RB	
15,5									Yellow Sponge		YE							
16						Lettuce			Healthy									
16,5																	RB	
17					Finger				Healthy									
17,5																YA		
18									Brown Sponge		BRO							
18,5																	SD	
19																	RC	
19,5																	RC	
20																	RB	
Total	0	0	4	0	2	2	0	1	0	9	0	0	0	0	0	3	26	
	0	3	11	4	3	6	2	5	0	34	0	0	0	0	0	30	89 GRAND TOTAL	

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 25-45m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: July 9, 2004      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					Finger				Healthy							
1,5														BA		
2															SD	
2,5														BA		
3														YA		
3,5															RC	
4						Lettuce			Healthy							
4,5															RC	
5						Lettuce			Healthy							
5,5				Brain					Healthy							
6									Brown Sponge		BRO					
6,5								Flower	Healthy							
7								Flower	Healthy							
7,5									Brown Sponge		BRO					
8			Boulder						Healthy							
8,5															RC	
9														BA		
9,5	Mustard hill								Healthy							
10														BA		
10,5														YA		
11														BA		
11,5															RC	
12														YA		
12,5															SD	
13															SD	
13,5			Boulder						Healthy							
14			Boulder						Healthy							
14,5															RC	
15			Boulder						Healthy							
15,5	Mustard hill								Healthy							
16															RB	
16,5															RB	
17														TA		
17,5															RC	
18				Brain					Healthy							
18,5														YA		
19								Flower	Healthy							
19,5									Brown Sponge		BRO					
20															RC	
<b>Total</b>	0	2	4	2	1	2	0	3	0	14	0	0	0	0	10	13

**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: July 9, 2004      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							Fire		Healthy												
1,5															TA						
2																SD					
2,5															BA						
3															BA						
3,5			Star						Healthy												
4								Flower	Healthy												
4,5																RC					
5																SD					
5,5																RB					
6															BA						
6,5															BA						
7																RC					
7,5																SD					
8																SD					
8,5																SD					
9																SD					
9,5																SD					
10																SD					
10,5				Grooved					Healthy												
11			Boulder						Healthy												
11,5																TA					
12																TA					
12,5																RC					
13																RC					
13,5																BA					
14																BA					
14,5									Purple Sea Rod	PU											
15																RB					
15,5																SD					
16														YA							
16,5																SD					
17																SD					
17,5																SD					
18																RB					
18,5																SD					
19																SD					
19,5																SD					
20																SD					
<b>Total</b>	0	0	2	1	0	0	1	1	1	0	5	0	0	1	0	0	0	0	0	10	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	
		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: July 14, 2004      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																RC			
2,5																RB			
3																RC			
3,5																RB			
4		Maze							Healthy										
4,5			Boulder						Healthy										
5																SD			
5,5																RC			
6						Lettuce			Healthy										
6,5				Brain					Healthy										
7																RB			
7,5																RB			
8									Brown Sponge		BRO								
8,5																SD			
9																RB			
9,5														YA					
10																RC			
10,5																RC			
11																SD			
11,5							Fire		Healthy										
12																RC			
12,5															BA				
13						Lettuce			Healthy										
13,5																BA			
14																BA			
14,5																BA			
15																RC			
15,5																SD			
16																SD			
16,5																SD			
17																SD			
17,5															TA				
18																RC			
18,5																SD			
19																SD			
19,5															BA				
20																RC			
<b>Total</b>	0	1	1	1	0	2	1	0		0	6	0	0		0	0	0	7	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	OR Orange
		TR Trididemnum	

# PORTOMAREA MARINE MONITORING

## CORAL LINE TRANSECT

Transect No: 2, Depth 6m, Section 0-20m				Visibility: 30 m				Observer: Marjo van den Bulck																		
Date: July 1, 2004				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																RB										
1,5																RB										
2																RB										
2,5				Brain					Healthy																	
3									Starlet	Healthy																
3,5																RC										
4			Star						Healthy																	
4,5																SD										
5																RC										
5,5																RC										
6																RB										
6,5														BA												
7														BA												
7,5																SD										
8																RB										
8,5																SD										
9																RB										
9,5																RB										
10																RB										
10,5																SD										
11																RC										
11,5																RC										
12																RC										
12,5																RB										
13									Starlet	Healthy																
13,5			Great						Healthy																	
14																RB										
14,5																RB										
15																SD										
15,5																RB										
16																RB										
16,5																RB										
17																RB										
17,5																RB										
18																RC										
18,5																RB										
19																SD										
19,5																RB										
20																RB										
Total	0	0	2	1	0	0	0	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	33	
	0	2	5	5	0	1	1	1	2	0	16	0	0	3	1	0	0	0	0	0	0	36	104	GRAND TOTAL		
<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: 30 m      Observer: Marjo van den Bulck  
 Date: July 1, 2004      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		Mustard hill							Healthy								
1																SD	
1,5																RC	
2																RC	
2,5																RB	
3																TA	
3,5																RB	
4																RB	
4,5																RB	
5																RC	
5,5		Maze							Healthy								
6																TA	
6,5																YA	
7																RB	
7,5																RB	
8																TA	
8,5																RB	
9																SD	
9,5																TA	
10																YA	
10,5																RC	
11																TA	
11,5																TA	
12																TA	
12,5																RC	
13																RB	
13,5																RB	
14																YA	
14,5																RC	
15																RB	
15,5																RB	
16																SD	
16,5																RB	
17																TA	
17,5																TA	
18																RB	
18,5																SD	
19																TA	
19,5																SD	
20																RC	
<b>Total</b>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	13	25

**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: 30 m      Observer: Marjo van den Bulck  
 Date: July 1, 2004      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															SD	
1,5															RC	
2															RC	
2,5					Lettuce			Healthy								
3														TA		
3,5														TA		
4															SD	
4,5														YA		
5								Encrusting Gorgonian	ENC							
5,5															RC	
6															RB	
6,5		Boulder						Healthy								
7															RC	
7,5															RB	
8								Brown Sponge		BRO						
8,5														YA		
9															RB	
9,5															RB	
10															RC	
10,5														TA		
11															RC	
11,5														YA		
12															RC	
12,5															SD	
13															RB	
13,5														YA		
14		Boulder						Healthy								
14,5															RC	
15		Boulder						Healthy								
15,5															SD	
16			Brain					Healthy								
16,5														TA		
17														TA		
17,5														TA		
18															RC	
18,5															SD	
19															RB	
19,5															SD	
20															RC	
<b>Total</b>	0	0	3	1	0	1	0	0	0	5	0	0	0	0	10	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		
				TR	Trididemnum		



**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 2, Depth 6m, Section 75-95m      Visibility: 30 m      Observer: Marjo van den Bulck  
 Date: July 1, 2004      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																RC	
1,5				Brain					Healthy								
2														YA			
2,5																RB	
3							Fire		Healthy								
3,5																YA	
4									Black Sea Rod	BLA							
4,5																RB	
5									Black Sea Rod	BLA							
5,5																BA	
6																TA	
6,5				Brain					Healthy								
7				Brain					Healthy								
7,5																RC	
8																TA	
8,5																SD	
9																SD	
9,5																SD	
10														YA			
10,5																RB	
11																TA	
11,5																TA	
12																SD	
12,5																SD	
13																SD	
13,5																TA	
14																RC	
14,5																SD	
15																TA	
15,5																RB	
16																TA	
16,5																RB	
17																RC	
17,5																RC	
18																RB	
18,5																RB	
19																SD	
19,5																RB	
20																RB	
<b>Total</b>	0	0	0	3	0	0	1	0			2	0	0	0	0	11	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		
				TR	Trididemnum		

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 3, Depth 10m, Section 0-20m		Visibility: 25 m		Observer: Marjo van den Bulck																
Date: July 6, 2004		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	TA				
1															TA					
1,5															TA					
2																	RC			
2,5																TA				
3																TA				
3,5																TA				
4															TA					
4,5																TA				
5																		SD		
5,5															TA					
6																BA				
6,5																	SD			
7																TA				
7,5																		RC		
8																		RB		
8,5																BA				
9							Lettuce		Healthy											
9,5							Lettuce		Healthy											
10			Boulder						Healthy											
10,5			Boulder						Healthy											
11			Boulder						Healthy											
11,5							Lettuce		Healthy											
12																		RC		
12,5				Brain					Healthy											
13				Brain					Healthy											
13,5																		RB		
14																		RB		
14,5																TA				
15																		RB		
15,5									Purple Sea Rod	PU										
16																TA				
16,5																		RB		
17																BA				
17,5			Boulder						Healthy											
18			Boulder						Healthy											
18,5																		SD		
19																		SD		
19,5																TA				
20																		SD		
										PD	H	S	BL							
Total	0	0	5	2	0	3	0	0	0	0	10	0	0	1	0	0	0	4	12	13
	0	0	6	2	0	5	0	0	0	0	13	0	0	4	1	0	0	11	70	61
<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					ENCR	Encrusting					
								TR	Trididemnum											

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 3, Depth 10m, Section 25-45m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: July 6, 2004      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															SD		
2															SD		
2,5						Lettuce		Healthy									
3														TA			
3,5															SD		
4															SD		
4,5														TA			
5																RB	
5,5															SD		
6															SD		
6,5								Purple Sea Rod	PU								
7																SD	
7,5														TA			
8															SD		
8,5														TA			
9														TA			
9,5														BA			
10														TA			
10,5														TA			
11														TA			
11,5														TA			
12								Sea Plume	PU								
12,5													TA				
13								Encrusting Gorgonian	ENCR								
13,5																RB	
14																SD	
14,5														BA			
15														TA			
15,5																SD	
16																RB	
16,5																SD	
17														TA			
17,5														BA			
18														TA			
18,5														TA			
19																SD	
19,5																SD	
20														BA			
<b>Total</b>	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	18	17

**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: 25 m      Observer: Marjo van den Bulck  
 Date: July 6, 2004      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															TA		
4,5																SD	
5															TA		
5,5													TA				
6													TA				
6,5														BA			
7																SD	
7,5															TA		
8															TA		
8,5																SD	
9															TA		
9,5																SD	
10													TA				
10,5														TA			
11																SD	
11,5															TA		
12															TA		
12,5														TA			
13															TA		
13,5															TA		
14															BA		
14,5															TA		
15															TA		
15,5													TA				
16														TA			
16,5									Yellow Sponge		YE						
17																RC	
17,5																SD	
18																SD	
18,5																RC	
19																RC	
19,5															TA		
20															TA		
<b>Total</b>	0	0	0	0	0	0	0	0			0	1	0	0	6	19	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	OR	Orange
				TR	Trididemnum		

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 3, Depth 10m, Section 75-95m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: July 6, 2004      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																TA	
2																TA	
2,5																TA	
3																TA	
3,5																	SD
4																TA	
4,5																TA	
5																TA	
5,5																	RB
6																TA	
6,5							Lettuce		Healthy								
7																TA	
7,5																YA	
8																	RB
8,5																	RB
9																TA	
9,5																	SD
10																TA	
10,5																TA	
11																	RB
11,5																	SD
12																TA	
12,5																TA	
13																TA	
13,5																	RB
14																	SD
14,5																TA	
15																TA	
15,5																BA	
16																	SD
16,5				Boulder					Healthy								
17																	RC
17,5																TA	
18																TA	
18,5																	SD
19																	RB
19,5																	RB
20																	SD
<b>Total</b>	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	21	17

**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-04

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	12		13	4,33	6,66
	French Angelfish			1	1	0,33	0,58
	Queen Angelfish						
	Rock Beauty			1	1	1,00	
BASSLET	Fairy Basslet	20		8	28	14,00	8,49
BLENNY	Redlip Blenny						
	Honeycomb Cowfish	1			1	1,00	
BOXFISH	Smooth Trunkfish						
	Spotted Trunkfish						
	Banded Butterflyfish						
BUTTERFLYFISH	Four-eye Butterflyfish	4	5	3	12	4,00	1,00
	Longsnout Butterflyfish			1	1	1,00	
	Blue Chromis	167	5	154	326	108,67	90,01
CHROMIS	Brown Chromis	289	140	250	679	226,33	77,27
	Beaugregory Damselfish						
DAMSELFISH	Bicolor Damselfish	138	440	265	843	281,00	151,63
	Cocoa Damselfish		10	4	14	7,00	4,24
	Dusky Damselfish		20	11	31	15,50	6,36
	Sergeant Major						
	Threespot Damselfish	47	37	27	111	37,00	10,00
	Yellowtail Damselfish						
DRUM	Spotted Drum						
EEL	Goldentail Moray						
	Sharptail Eel						
	Spotted Moray			2	2	1,00	1,41
FILEFISH	Orangespotted Filefish	1	1		2	1,00	
	Whitespotted filefish	1			1	1,00	
FLOUNDER	Peacock Flounder						
GOATFISH	Spotted Goatfish						
	Yellow Goatfish	33	4	3	40	13,33	17,04
GOBY	Bridled Goby	137	87	83	307	102,33	30,09
	Neon Goby	4	2	8	14	4,67	3,06
	Peppermint Goby	28	34	25	87	29,00	4,58
GROUPEr	Coney		4		4	2,00	2,83
	Graysby	5		7	12	4,00	3,61
	Rock Hind						
	Tiger Grouper						
GRUNT	Bluestriped Grunt						
	French Grunt	1	6	4	11	3,67	2,52
	Smallmouth Grunt	1	2	2	5	1,67	0,58
HAMLET	Barred Hamlet	4			4	1,33	2,31
	Black Hamlet		2	1	3	1,50	0,71
	Butter Hamlet	1	1	1	3	1,00	
	Yellowtail Hamlet	4		2	6	3,00	1,41
HOGFISH	Spanish Hogfish	2	1	3	6	2,00	1,00
JACK	Bar Jack		1	1	2	1,00	
MACKEREL	Cero						
	Blue Parrotfish						
	Princess Parrotfish	22	16	20	58	19,33	3,06
	Queen Parrotfish			3	3	1,00	1,73
	Redband Parrotfish	9	3	5	17	5,67	3,06
	Stoplight Parrotfish	7	6	14	27	9,00	4,36
	Striped Parrotfish	7	1	3	11	3,67	3,06
PUFFER	Balloonfish						
	Sharpnose Puffer	7	3	8	18	6,00	2,65
RAY	Southern Stingray						
SCORPIONFISH	Spotted Scorpionfish						
SEABASS	Creolefish			1	1	0,50	0,71
	Harlequin Bass	8	14	7	29	9,67	3,79
	Tobaccofish						
SNAPPER	Mahogany Snapper						
	Schoolmaster	1			1	1,00	
	Yellowtail Snapper						
SQUIRRELFISH	Blackbar Soldierfish	9	2	6	17	5,67	3,51
	Squirrelfish	14	2	10	26	8,67	6,11
SURGEONFISH	Blue Tang	3	5	5	13	4,33	1,15
	Doctorfish			1	1	1,00	
	Ocean Surgeon			3	3	3,00	
	Bluehead Wrasse	41	238	35	314	104,67	115,51
WRASSE	Clown Wrasse	5	6	1	12	4,00	2,65
	Creole Wrasse	53	1		54	18,00	30,32
	Rainbow Wrasse						
	Slippery Dick		4		4	2,00	2,83
	Yellowhead Wrasse	13	32	34	79	26,33	11,59
	Cornetfish						
OTHERS	Hawkfish, Redspotted						
	Sand Diver	1			1	0,33	0,58
	Sand Tilefish						
	Soapfish, Greater						
	Trumpetfish		2	1	3	1,00	1,00
<b>TOTAL</b>		<b>1089</b>	<b>1149</b>	<b>1024</b>	<b>3262</b>	<b>1087,33</b>	
Invertebrates		Transect 1 Depth:12m	Transect 2 Depth: 6m	Transect 3 Depth:10m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone			3	11	3,67	2,08
	Corkscrew Anemone	2	6		8	2,67	3,51
	Giant Anemone	1	26	7	34	11,33	13,05
	Knobby Anemone	58	37	30	125	41,67	14,57
TUBE WORMS	Christmas tree Worms	209	492	193	894	298,00	168,20
	Ghost Feather Duster	2	6	2	10	3,33	2,31
	Magnificent Feather Duster	1	1	3	5	1,67	1,15
	Social Feather Duster			1	1	1,00	
	Split Crown Feather Duster	12	36	12	60	20,00	13,86
	Star Horseshoe Worm	1	6	7	14	4,67	3,54
	Variegated Feather Duster	3	5	3	11	3,67	1,15
CRUSTACEANS	Banded Coral Shrimp	2	4		6	2,00	2,00
	Heremite Crab						
	Pederson Cleaner Shrimp	16	3	7	26	8,67	6,66
	Red Snapping Cleaner Shrimp						
MOLLUSKS	Yellowline Arrow Crab						
	Amber Pen Shell			1	1	1,00	
	Lettuce Sea Slug	4			4	4,00	
	Queen Conch		1		1	1,00	
ECHINODERMS	Rough File Clam	1	1		2	1,00	
	Reef Urchin						
<b>TOTAL</b>		<b>312</b>	<b>624</b>	<b>262</b>	<b>1198,00</b>	<b>399,33</b>	

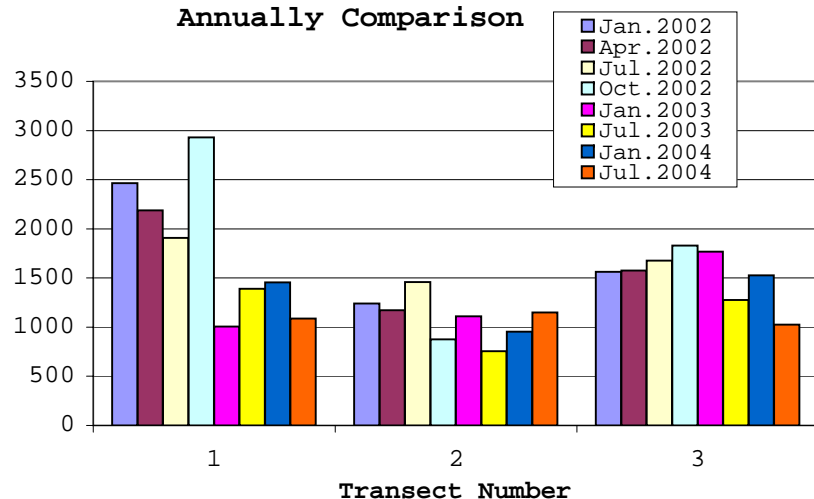
**PORTOMAREA MARINE MONITORING  
FISH AND INVERTEBRATE QUARTERLY/SEMI-ANNUALLY COMPARISON**

	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

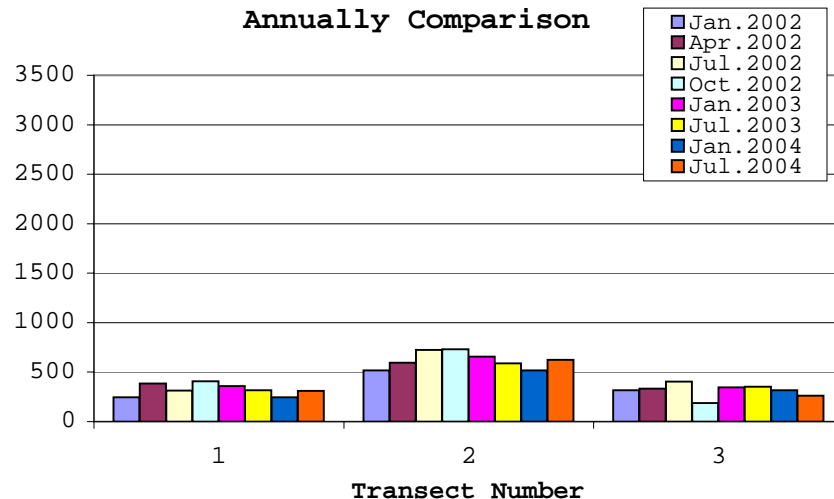
	Transect 1 - Depth 12m			Transect 2 - Depth 6m			Transect 3 - Depth 10m		
	Jan.2003		July 2003	Jan.2003		July 2003	Jan. 2003		July 2003
<b>Fish</b>	1007		1390	1109		754	1767		1276
<b>Invertebrates</b>	359		318	656		588	347		353

	Transect 1 - Depth 12m			Transect 2 - Depth 6m			Transect 3 - Depth 10m		
	Jan.2004		July 2004	Jan.2004		July 2004	Jan. 2004		July 2004
<b>Fish</b>	1454		1089	955		1149	1526		1024
<b>Invertebrates</b>	246		312	519		624	318		262

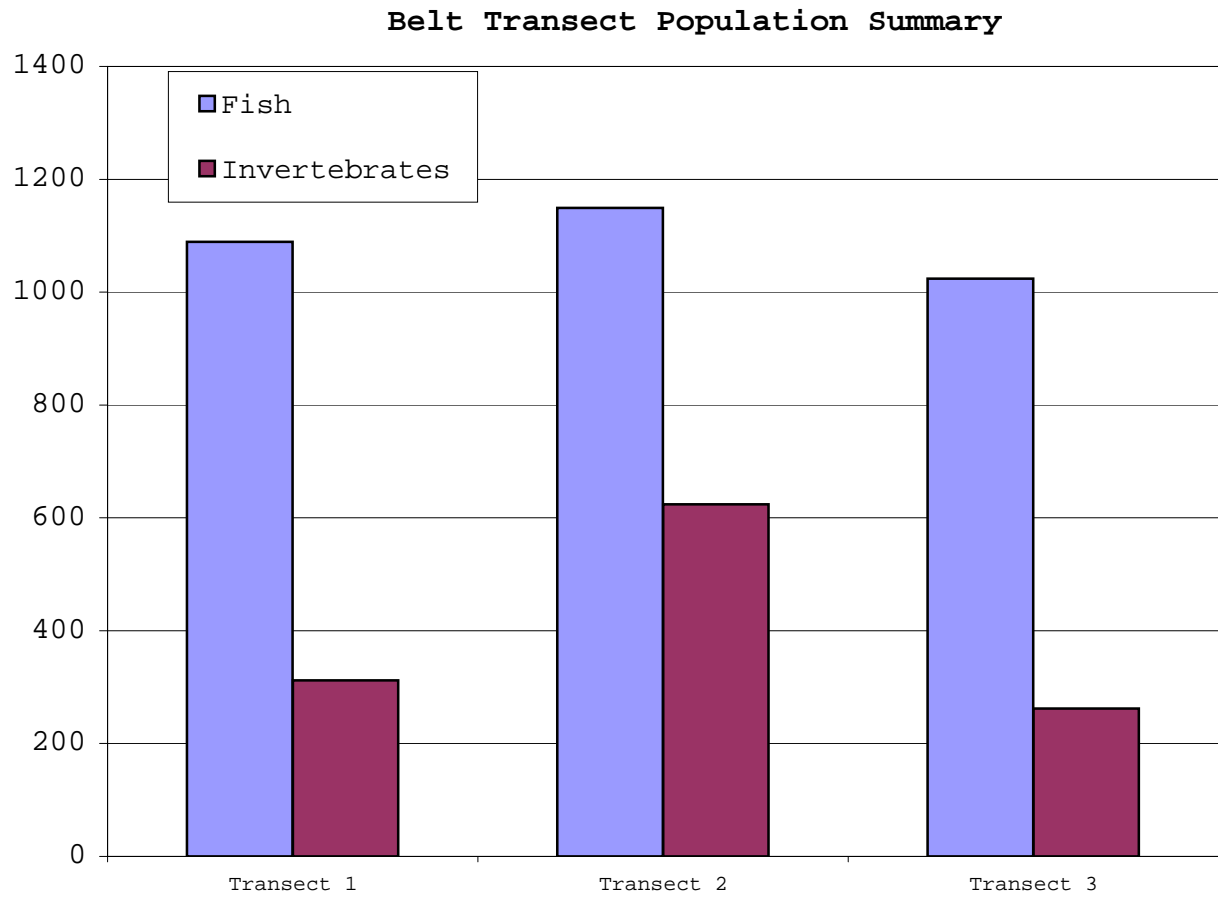
**Fish Population Quarterly/Semi-Annually Comparison**



**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 9, 2004 Time: 8:30 a.m.

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							
BASSLET	Fairy Basslet	8	10		2	20	6,67	4,16
BLENNY								
BOXFISH	Smooth Trunkfish							
	Honeycomb Cowfish			1		1	1,00	
BUTTERFLYFISH	Banded Butterflyfish							
	Foureye Butterflyfish		2		2	4	2	
	Longsnout Butterflyfish							
CHROMIS	Blue Chromis	17	41	68	41	167	41,75	20,84
	Brown Chromis	90	48	60	91	289	72,25	21,64
DAMSELFISH	Bicolor	58	19	29	32	138	34,50	16,62
	Sergeant Major							
	Threespot	15	11	16	5	47	11,75	4,99
	Yellowtail							
DRUM	Spotted Drum							
EEL	Green Moray							
	Spotted Moray							
FILEFISH	Orangespotted Filefish				1	1	1,00	
	Whitespotted Filefish			1		1	1,00	
FLOUNDER	Peacock Flounder							
GOATFISH	Yellow Goatfish	8	5	13	7	33	8,25	3,40
	Spotted Goatfish							
GOBY	Bridled Goby	30	2	45	60	137	34,25	24,74
	Neon Goby	1	1	2		4	1,33	0,58
	Peppermint Goby	5	15	6	2	28	7	5,60
	Rock Hind		1	2	2	5	1,67	0,58
GRUNT	Bluestriped Grunt							
	French Grunt			1		1	1	
	Smallmouth Grunt		1			1	1,00	
HAMLET	Barred Hamlet	2	1		1	4	1,333333	0,58
	Butter Hamlet	1				1	1	
	Yellowtail Hamlet	1	1	1	1	4	1	
HOGFISH	Spanish Hogfish	2				2	2,00	
JACK	Bar Jack							
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	2	10	5	5	22	5,5	3,32
	Queen Parrotfish							
	Redband Parrotfish	3	3	2	1	9	2,25	0,96
	Stoplight Parrotfish	1	2	1	3	7	1,75	0,96
PUFFER	Striped Parrotfish	4		1	2	7	2,33	1,53
	Balloonfish							
	Sharpnose Puffer	1	2	1	3	7	1,75	0,96
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish							
	Harlequin Bass	3	2	2	1	8	2	0,82
SNAPPER	Schoolmaster	1				1	1,00	
	Yellowtail Snapper							
SQUIRRELFISH	Blackbar Soldierfish	4	2	2	1	9	2,25	1,26
	Squirrelfish	7	4	1	2	14	3,5	2,65
SURGEONFISH	Blue Tang				3	3	3	
	Doctorfish							
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	15	4	5	17	41	10,25	6,70
	Clown Wrasse	1		2	2	5	1,666667	0,58
	Creole Wrasse	1		50	2	53	17,66667	28,01
	Slippery Dick							
OTHERS	Yellowhead Wrasse		4	2	7	13	4,33	2,52
	Sand Diver		1			1	1	
	Soapfish,greater							
	Trumpetfish							
<b>TOTAL</b>		<b>281</b>	<b>193</b>	<b>319</b>	<b>296</b>	<b>1089</b>	<b>272,25</b>	
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	1,00	
	Knobby Anemone	17	16	17	8	58	14,5	4,36
TUBE WORMS	Christmas tree Worms	67	51	35	56	209	52,25	13,30
	Ghost Feather Duster	1			1	2	1	
	Magnificent Feather Duster		1			1	1,00	
	Split Crown Feather Duster	8	3	1		12	4	3,61
	Star Horseshoe Worm	1				1	1	
	Variegated Feather Duster		2		1	3	1,50	0,71
CRUSTACEANS	Banded Coral Shrimp				2	2	2	
	Pederson Cleaner Shrimp	2	5	4	5	16	4	1,41
	Yellowline Arrow Crab							
MOLLUSKS	Rough File Clam				1	1	1	
	Queen Conch							
	Lettuce Sea Slug		4			4	4	
ECHINODERMS	Reef Urchin							
<b>TOTAL</b>		<b>97</b>	<b>83</b>	<b>58</b>	<b>74</b>	<b>312</b>	<b>78</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 #2, Depth: 6m

Date: July 1, 2004 Time: 8:38 a.m.

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	5	6	1		12	4,00	2,65
	French Angelfish							
	Rock Beauty							
BASSLET								
BIGEYE								
BLENNY	Redlip Blenny							
BOXFISH	Smooth Trunkfish							
	Spotted Trunkfish							
BUTTERFLYFISH	Banded Butterflyfish							
	Foureye Butterflyfish	3			2	5	2,50	0,71
	Longsnout Butterflyfish							
CARDINALFISH								
CHROMIS	Blue Chromis			3	2	5	2,50	0,71
	Brown Chromis	24	7	59	50	140	35,00	23,85
DAMSELFISH	Bicolor Damselfish	94	150	91	105	440	110,00	27,34
	Cocoa Damselfish	4	1	5		10	3,33	2,08
	Dusky Damselfish	3	1	10	6	20	5,00	3,92
	Sergeant Major							
	Threespot Damselfish	4		20	13	37	12,33	8,02
	Yellowtail Damselfish							
DRUM								
EEL	Goldentail Moray							
	Spotted Moray							
FILEFISH	Orangespotted Filefish				1	1	1,00	
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish	2			2	4	2,00	
GOBY	Bridled Goby	22	15	30	20	87	21,75	6,24
	Neon Goby	1	1			2	1,00	
	Peppermint Goby	13	7	9	5	34	8,50	3,42
GROUPER	Coney	1	3			4	2,00	1,41
	Grasby							
GRUNT	Bluestriped Grunt							
	French Grunt	2	1	1	2	6	1,50	0,58
	Smallmouth Grunt			2		2	2,00	
HAMLET	Barred Hamlet							
	Black Hamlet	1		1		2	1,00	
	Butter Hamlet			1		1	1,00	
HOGFISH	Spanish Hogfish			1		1	1,00	
JACK	Bar Jack	1				1	1,00	
MACKEREL	Cero							
PARROTFISH	Princess Parrotfish	8	4	1	3	16	4,00	2,94
	Queen Parrotfish							
	Redband Parrotfish	2			1	3	1,50	0,71
	Stoplight Parrotfish	1		3	2	6	2,00	1,00
	Striped Parrotfish				1	1	1,00	
PUFFER	Sharpnose Puffer		1	2		3	1,50	0,71
RAY								
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish							
	Harlequin Bass	4	4	3	3	14	3,50	0,58
	Tobaccofish							
SQUIRRELFISH	Blackbar Soldier			2		2	2,00	
	Squirrelfish	1		1		2	1,00	
SURGEONFISH	Blue Tang		3	2		5	2,50	0,71
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	26	172	5	35	238	59,50	76,05
	Clown Wrasse	4	2			6	3,00	1,41
	Creole Wrasse			1		1	1,00	
	Slippery Dick		4			4	4,00	
	Yellowhead Wrasse	8	11	5	8	32	8,00	2,45
OTHERS	Redspotted Hawkfish							
	Lizardfish							
	Sand Diver							
	Soapfish, Greater							
	Trumpetfish	1		1		2	1,00	
<b>TOTAL</b>		<b>235</b>	<b>393</b>	<b>260</b>	<b>261</b>	<b>1149</b>	<b>287,25</b>	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone							
	Corkscrew Anemone	5			1	6	3,00	2,83
	Giant Anemone	7	7	3	9	26	6,50	2,52
	Knobby Anemone	5	5	15	12	37	9,25	5,06
TUBE WORMS	Christmas tree Worms	174	36	120	162	492	123,00	62,45
	Ghost Feather Duster	2		1	3	6	2,00	1,00
	Magnificent Feather Duster	1				1	1,00	
	Social Feather Duster							
	Split Crown Feather Duster	4	2	24	6	36	9,00	10,13
	Star Horseshoe Worm	3	3			6	3,00	
CRUSTACEANS	Variegated Feather Duster	4	1			5	2,50	2,12
	Banded Coral Shrimp	4				4	4,00	
	Pederson Cleaner Shrimp	2			1	3	1,50	0,71
MOLLUSKS	Yellowline Arrow Crab							
	Atlantic Thorny-oyster							
	Penn Shell	2					2,00	
	Queen Conch	1				1	1,00	
ECHINODERMS	Rough Fileclam			1		1	1,00	
	Reef Urchin							
<b>TOTAL</b>		<b>214</b>	<b>54</b>	<b>164</b>	<b>194</b>	<b>624</b>	<b>156,50</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: July 6, 2004 Time: 8:16 a.m.

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	1				1	1,00	
	Rock Beauty	1				1	1,00	
BARRACUDA								
BASSLET	Fairy Basslet	7			1	8	4,00	4,24
BIGEYE								
BLENNY								
BOXFISH	Honeycomb Cowfish							
	Smooth Trunkfish							
BUTTERFLYFISH	Foureye Butterflyfish		1		2	3	1,50	0,71
	Banded Butterflyfish							
	Longsnout Butterflyfish			1		1	1,00	
CHROMIS	Blue Chromis	100	14	12	28	154	38,50	41,61
	Brown Chromis	46	34	100	70	250	62,50	29,14
	Sunshinefish							
DAMSELFISH	Beaugregory Damselfish							
	Bicolor Damselfish	59	102		104	265	88,33	25,42
	Cocoa Damselfish				4	4	4,00	
	Dusky Damselfish	2		5	4	11	3,67	1,53
	Sergeant Major							
	Threespot Damselfish	12	3	11	1	27	6,75	5,56
	Yellowtail Damselfish							
DRUM	Spotted Drum							
EEL	Sharptail Eel							
	Spotted Moray		2			2	2,00	
FILEFISH	Orangespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish		3			3	3,00	
GOBY	Bridled Goby	33	20	20	10	83	20,75	9,43
	Neon Goby	2	5		1	8	2,67	2,08
	Peppermint Goby	5	11	9		25	8,33	3,06
GROUPE	Coney							
	Graysby	2	2	1	2	7	1,75	0,50
	Rock Hind							
	Tiger Grouper							
GRUNT	Bluestriped Grunt							
	French Grunt	1	1	1	1	4	1,00	
	Smallmouth Grunt	2				2	2,00	
HAMLET	Barred Hamlet							
	Black Hamlet	1				1	1,00	
	Butter Hamlet				1	1	1,00	
	Yellowtail Hamlet			2		2	2,00	
HOGFISH	Spanish Hogfish	1	1		1	3	1,00	
JACK	Bar Jack			1		1	1,00	
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	6	8	1	5	20	5,00	2,94
	Queen Parrotfish	2			1	3	1,50	0,71
	Redband Parrotfish	2	2	1		5	1,67	0,58
	Stoplight Parrotfish	6	2	3	3	14	3,50	1,73
	Striped Parrotfish		2		1	3	1,50	0,71
PUFFER	Sharpnose Puffer	3	2		3	8	2,67	0,58
RAY	Southern Stingray							
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creolefish		1			1	1,00	
	Harlequin Bass	1		2	4	7	2,33	1,53
SNAPPER	Schoolmaster							
	Yellowtail Snapper							
SQUIRRELFISH	Blackbar Soldierfish	6				6	6,00	
	Squirrelfish	4	3	1	2	10	2,50	1,29
SURGEONFISH	Blue Tang	1	2		2	5	1,67	0,58
	Doctorfish		1			1	1,00	
	Ocean Surgeon	1		2		3	1,50	0,71
WRASSE	Bluehead Wrasse	17	2		16	35	11,67	8,39
	Clown Wrasse	1				1	1,00	
	Creole Wrasse							
	Puddingwife							
	Slippery Dick							
	Yellowhead Wrasse	10	7	11	6	34	8,50	2,38
OTHERS	Sand Diver							
	Trumpetfish	1				1	1,00	
<b>TOTAL</b>		<b>336</b>	<b>231</b>	<b>184</b>	<b>273</b>	<b>1024</b>	<b>256</b>	
Atlantic Belt Transect: Invertebrates		0-20m	25-45m	50-70m	75-100m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone							
	Corkscrew Anemone		1	1	1	3	1,00	
	Giant Anemone	1		4	2	7	2,33	1,53
	Knobby Anemone	8	10	7	5	30	7,50	2,08
TUBE WORMS	Christmas tree Worm	67	35	22	69	193	48,25	23,43
	Ghost Feather Duster	1	1			2	1,00	
	Magnificent Feather Duster		1		2	3	1,50	0,71
	Social Feather Duster			1		1	1,00	
	Split Crown Feather Duster	5			7	12	6,00	1,41
	Star Horseshoe Worm							
	Variegated Feather Duster		1	2		3	1,50	0,71
CRUSTACEANS	Banded Coral Shrimp							
	Pederson Cleaner Shrimp	3	2	1	1	7	1,75	0,96
	Red Snapping Cleaner Shrimp							
MOLLUSKS	Amber Penshell			1		1	1,00	
<b>TOTAL</b>		<b>85</b>	<b>51</b>	<b>39</b>	<b>87</b>	<b>262</b>	<b>65,5</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 : July 14, 2004  
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	2	Leaf coral (lettuce)	NE	T	-	4	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	> 150	66,00	90	BROKEN OFF, RELOCATED			Lying against Pallet 1, SWB
10 R	2 LP	2	Sea Rod, black	S	M	3	23	10	ire C. on base	N	N	New coral growth on this ball
			Star Coral, smooth	SW	H	-	4	5	N	N	N	Fire coral on this ball
10R	3 P	2	Maze coral	NW	L	GONE						New coral growth on this ball
			Sea Rod, purple	W	T	GONE						
			Staghorn coral	NE	T				BROKEN OFF, IN OYSTER 4 NOW			Fire coral on this ball
			Star coral	NE	H	-	7	9,5	N	N	N	
10 R	4 O	1	Finger coral	W	L	GONE						New coral growth on this ball.
			Staghorn coral		T	RELOCATED	26	51	N	N	Y	Lumpy Overgrowing Sponge on this ball
10R	5 O	1	Sea Rod, purple	NE	H	GONE						New coral growth on this ball
			Sea Rod, white	NW	M	GONE						Brain coral on rubble lying against this ball
			Sea Rod, white	SW	H	GONE						
			Staghorn coral	S	M	GONE						
			Staghorn coral		T	RELOCATED	30	48	N	N	Y	
10R	6 LP	1	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	RELOCATED	38	67	N	Y	N	Plug from Pallet 8
10R	7 O	0	No Plugs on this ball									New growth on this ball.
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	10	20	16	N	Y	N	Marine putty to replug
			Sea Rod, black	S	M	6	26	15	Y	Y	N	
			Sea Rod, white	E	H	129	23	37	Y	N	N	
			Staghorn coral	S	T	GONE						
			Staghorn coral	SW	T	BROKEN OFF IN OYSTER 5, GROWING THERE.						
			Staghorn coral	W	T	GONE IN LO PRO 6, GROWING THERE.						
<b>Subtotal</b>			<b>12 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	1	Finger coral	N	M-on oyster	15	8	9	N	Y	One tip	New coral growth on this ball
			Finger coral	NW	M-on oyster	GONE						Fire coral on this ball
			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	1	Staghorn	N	H	> 150	45	80	N	Y	Y	No new coral growth on this ball
10 R	12 LP	1	Brain coral	NW	T	-	7	10	N	Y	Y	Dying?
			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	3	Leaf coral ( Lettuce)	N	M	GONE						New coral growth on this ball
			Sea Rod, Black	NW	H	7	19	17	N	Y	N	Fire coral on this ball
			Sea Rod, Black	NW	M	10	17	20	N	Y	N	Fire coral on plug base
			Staghorn	SW	H	RELOCATED	46	56				Lying against Lo Pro 15
10 R	14 U	10	Brain coral	N	L	-	5,5	6,5	N	Y	N	New coral growth on this ball
			Finger coral	N	M	52	9,5	17,5	N	Y	N	Fire coral on this ball
			Leaf coral ( Lettuce)	E	M	4	5	6,5	Y	Y	N	
			Leaf coral ( Lettuce)	NW	L	2	4	5,5	Y	Y	N	
			Leaf coral ( Lettuce)	NE	M	-	4	5	Y	Y	N	
			Leaf coral ( Lettuce)	SE	M	-	4	4	Overgrown by Algae			12o'clock
			Leaf coral ( Lettuce)	SE	ML	GONE						Dying? Position SEML in stead of SSEML
			Leaf coral ( Lettuce)	SSE	ML	3	3,5	6	Y	N	N	8 o'clock
			Leaf coral ( Lettuce)	SSE	L	1	3,5	6,5	Y	N	N	5 o'clock
			Leaf coral ( Lettuce)	SE	M	GONE						
			Leaf coral ( Lettuce)	SW	ML	3	3	3	N	Y	Y	Partially overgrown by Lumpy Overgrowing
			Leaf coral ( Lettuce)	SW	M	GONE						
			Pencil coral	NE	M	GONE						
			Staghorn	S	H	RELOCATED	51	51	is lying between Ultra 14 and B			
			Staghorn	N	H	GONE						
10R	15 LP	2	Brain coral	SW	T	-	5,5	7,5	N	N	N	New coral growth on this ball
			Brain coral	SE	H	-	5	5,5	N	Y	Y	
10R	16 B	1	Brain coral	NW	H	-	2,5	8	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						No 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						New coral growth on this ball
			Sea Rod, black	W	T	GONE						
			Sea Rod, purple	NW	M	GONE						
<b>Subtotal</b>			<b>19 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										
10R	20 O	0										
10R	21 O	0										
10R	22 LP	0										
10R	23 LP	2	Leaf coral (lettuce)	SE	H	GONE						New coral growth on this ball Fire coral on this ball
			Mustard hill	N	H	GONE						
			Sea rod, white	NW	H	31	16	11	N	Y	N	
			Sea rod, white	NW	M	33	18	14	N	Y	N	
			Finger coral	SW	H	GONE						
10R	24 P	2	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	-	2	6,5	N	N	N	
			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	RELOCATED	45	77	Where from?			
10R	25 B	1	Pencil coral	NW	M	6	1	5	N	N	Y	Previously identified as Mustard hill New coral growth. Fire coral on this ball
10R	26 LP	1	Maze coral	W	T	-	6,5	9	N	Y	Y	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	80	23	21	Y	Y	N	
10R	28 P	2	Finger coral	SW	H	GONE						New coral growth on this ball  Fire coral on this ball Algae all over coral plug
			Finger coral	NE	M		7	8	COVERED BY ALGAE			
			Flower coral	SE	H	GONE						
			Leaf coral (lettuce)	SW	M	2	5	6	N	Y	Y	
			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
10R	30 LP	0										
10R	31 O	0										
<b>Subtotal</b>		<b>9</b>										
<b>Total</b>		<b>40 Number of live coral plugs</b>										

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

Date : July 7, 2004  
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		7	Leaf coral (lettuce)	NW	T	3	10	12	N	Y	N	New coral growth on this ball.	
				Pencil coral	NE	T	14	2,5	7	N	Y	Y	Biggest part dying?	
				Pencil coral	N	H	3	0,5	2	N	Y	Y		
				Solitary Disk coral	N	L	DEAD							
				Staghorn coral	N	T	62	27	48	Y	N	N		
				Staghorn coral	S	T	> 100	44	67	N	Y	N		
				Staghorn coral	SW	T	> 100	41	65	Y	Y	N		
				Staghorn coral	NW	H	GONE							
				Staghorn coral	SE	H	20	35	32	N	Y	N		Branches broken off, in Oyster A
12L	2P		4	Pencil coral	NE	T	8	2,5/ 1	5/ 4,5	N	N	Y	Two Living parts	
				Pencil coral	SW	T	DEAD						New coral growth on this ball	
				Pencil coral	SE	H	16	2,5	4,5	N	N	Y	Broken off, lying against Pallet 2. Posi	
				Staghorn coral	NE	T	GONE							
				Staghorn coral	W	T	80	36	48					
				Staghorn coral	NW	T	44	27	34	Y	N	N		
				Staghorn coral	NE	H	GONE							
				Staghorn coral	SE	H	GONE							
12L	3B		2	Finger coral	NW	T	GONE						New coral growth on this ball.	
				Staghorn coral	SW	T	80	40	71	Y	N	N		
				Staghorn coral	NE	H	> 100	65	61	Y	N	N		
12L	4B		2	Staghorn coral	NE	H	GONE						New coral growth on this ball.	
				Staghorn coral	SW	T		56	88				Both plugs broken off, forming one coralformation against Bay 4	
				Staghorn coral	NW	H								
12L	5P		4	Finger coral	NE	T	2	5/ 0,5	2/ 0,5	N	Y	Y	Two Living parts	
				Finger coral	NW	L	2	2	4	N	N	N	Broken, repaired. New position: NEI	
				Staghorn coral	SE	T	GONE						New coral growth on this ball.	
				Staghorn coral	SW	T	GONE		IN	OYSTER C	NOW		Heigth: 46. Width: 66.	
				Staghorn coral	NW	T	> 100	40	61	Y	N	N	Heigth: 37. Width: 56.	
				Staghorn coral	N	H	GONE							
				Staghorn coral	SE	H	GONE							
				Staghorn coral	NE	H	GONE		IN	OYSTER	NOW			
				Staghorn coral	SW	H	GONE							
				Staghorn coral	WSW	H	GONE							
				Staghorn coral	NE	T	roken off	46	63					Lying on sandbottom against Pallet 5
<b>Total</b>				<b>19 Number of live coral plugs</b>										

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

Date : July 7, 2004  
Observer: Marjo van den Bulck

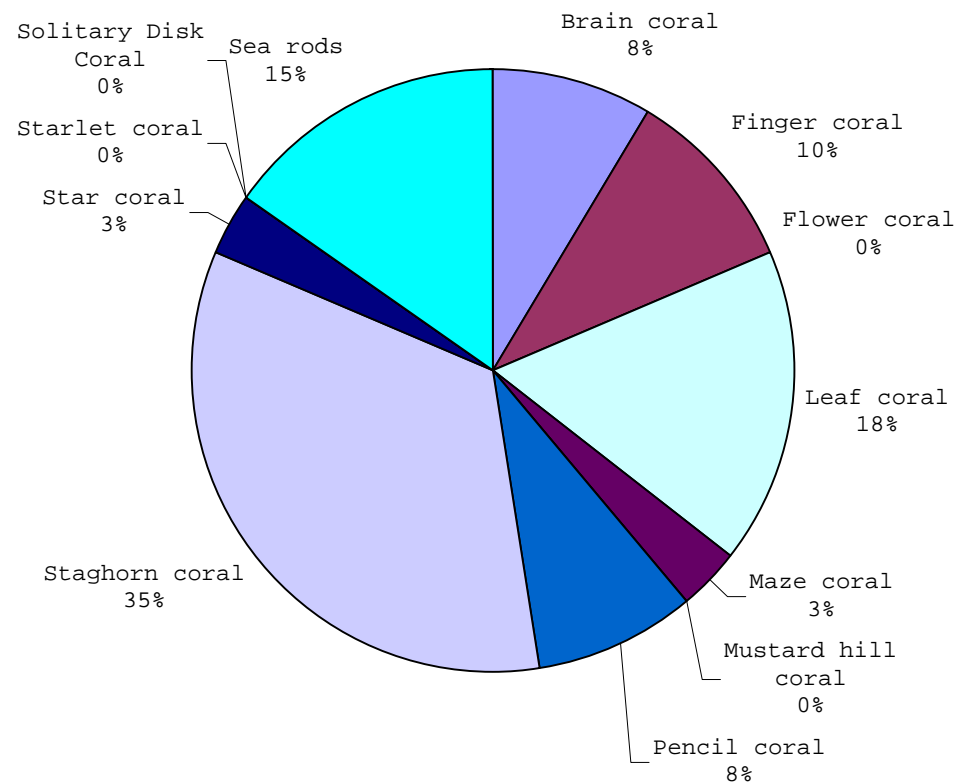
CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				direction	height							
18L	1LP	2	Sea Rod, black	N	T	9	18	25	Y	Y/N	N	New coral growth on this ball.
			Pencil coral	SE	M	24	5	6	N	N	N	
18L	2B	2	Flower coral	W	T	19 cups	4,5	7,5	N	N	N	New coral growth on this ball.
			Finger coral	SE	M	7	3,5	7,5	N	Y	Y	
18L	3B	2	Sea Rod, black	SW	T	5	11	8	Y	Y	N	New coral growth on this ball.
			Leaf coral ( Lettuce)	W	H	2	1	2,5	N	Y	Y	
			Pencil coral	NE	H	DEAD						
18L	4LP	2	Sea Rod, black	NE	T	11	16,5	15	N	N	N	New coral growth on this ball.
			Pencil coral	SE	M	12	2,5	4,5	Y	N	N	
18L	5B	3	Star coral	SE	T	-	2,5	5	Y	N	N	New coral growth on this ball.
			Sea Rod, white	SW	H	> 100	27	30	Y	N	N	
			Leaf Coral ( Lettuce)	NW	H	3	3	4	N	N	Y	
18L	6P	2	Leaf coral ( Lettuce)	E	T	3	2	5	N	N	N	New coral growth on this ball.
			Star coral	SW	T	-	4,5	5,5	Y	N	N	
18L	7P	2	Maze coral	E	T	-	7	11	N	N	N	New coral growth on this ball.
			Star coral	W	T	-	3,5	6,5	Y	N	N	
			Finger coral	NW	T	DEAD						
18L	8LP	0										
18L	9B	1	Star coral	NE	H	-	1,5	6,5	Y	N	N	New coral growth on this ball.
18L	10B	1	Finger coral	N	T	DEAD						New coral growth on this ball.
			Pencil coral	E	H	10	3	5	Y	Y	Y	
			Leaf coral ( Lettuce)	SW	H	DEAD						
18L	11LP	0										
18L	120	0										
<b>Total</b>			<b>17 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 JULY 2004  
CLUSTER 10 WEST/RIGHT, CLUSTER 12 EAST/LEFT**

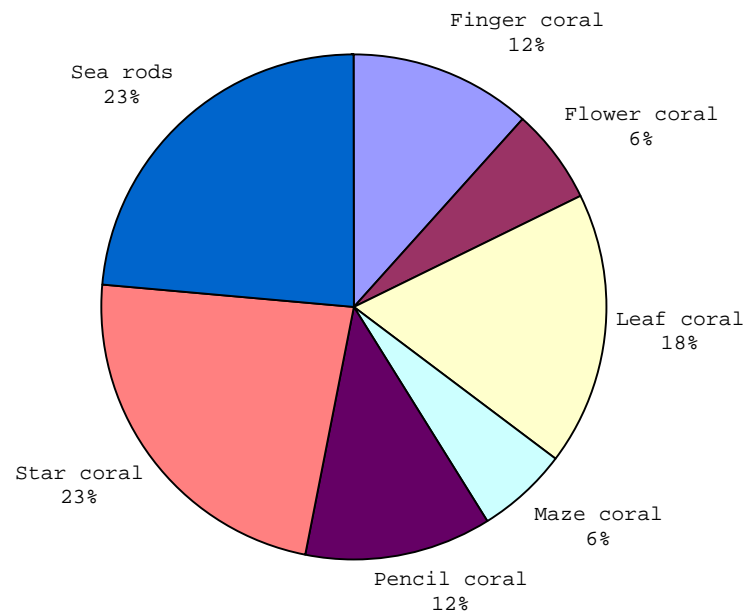
Coral Species	Number of Live Plugs	% of Total
Brain coral	5	8,47
Finger coral	6	10,17
Flower coral	0	0,00
Leaf coral	10	16,95
Maze coral	2	3,39
Mustard hill coral	0	0,00
Pencil coral	5	8,47
Staghorn coral	20	33,90
Star coral	2	3,39
Starlet coral	0	0,00
Solitary Disk Coral	0	0,00
Sea rods	9	15,25
black	5	
purple	0	
white	4	
<b>TOTAL</b>	<b>59</b>	<b>100</b>



PORTOMAREA MARINE MONITORING  
REEF BALL CORAL PLUG SPECIES SUMMARY

SPECIES DISTRIBUTION OF CORAL PLUGS ON REEF BALLS AS OF JULY 2004  
CLUSTER 18 EAST/LEFT

Coral Species	Number of Live Plugs		% of Total
Finger coral		2	11,76
Flower coral		1	5,88
Leaf coral		3	17,65
Maze coral		1	5,88
Pencil coral		2	11,76
Star coral		4	23,53
Sea rods		4	23,53
	black	3	
	white	1	
<b>TOTAL</b>		<b>17</b>	<b>100</b>

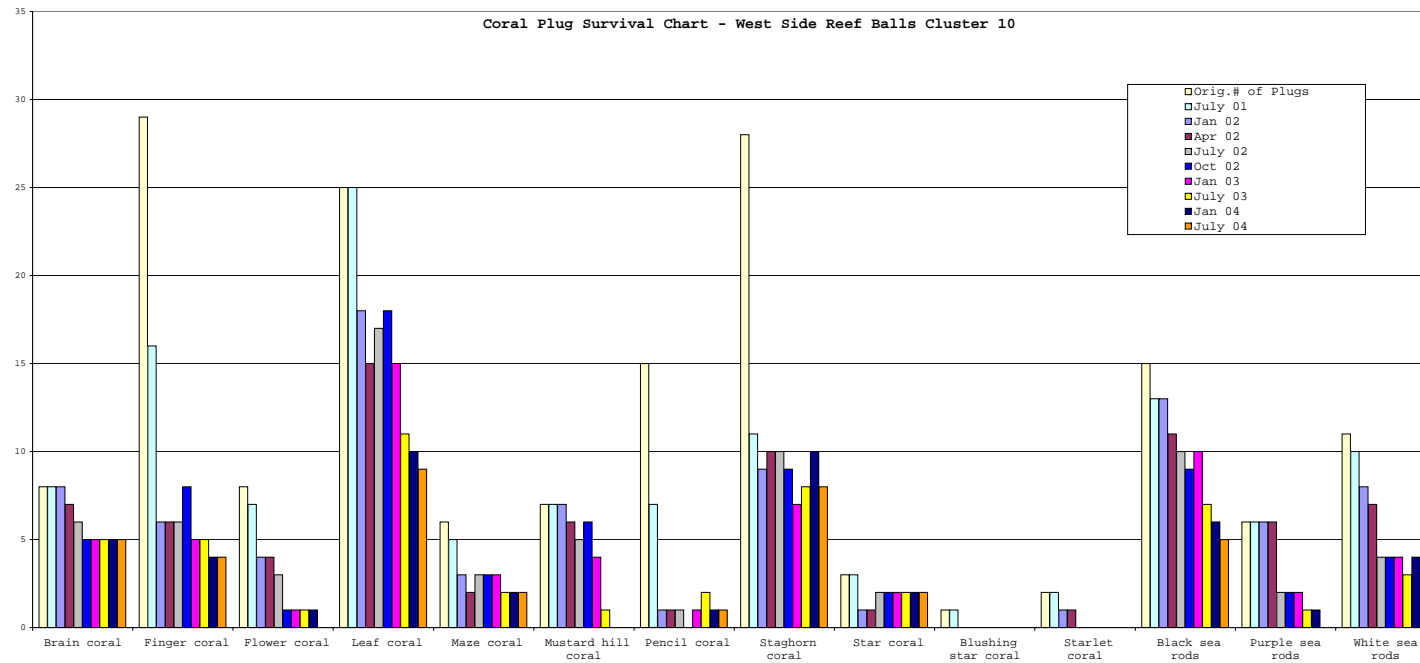


PORTOMAREA MARINE MONITORING

Coral Plug Survival Summary  
West Side Reef Balls, Cluster 10

July 2001 Monitoring (per M.Kuonen)				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 33 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%
			Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean
<b>TOTALS</b>	<b>164</b>	<b>121</b>	<b>26%</b>	<b>85</b>	<b>48%</b>	<b>77</b>	<b>53%</b>	<b>69</b>	<b>58%</b>	<b>67</b>	<b>59%</b>	<b>59</b>	<b>64%</b>	<b>48</b>	<b>71%</b>	<b>46</b>	<b>72%</b>	<b>40</b>	<b>76%</b>

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



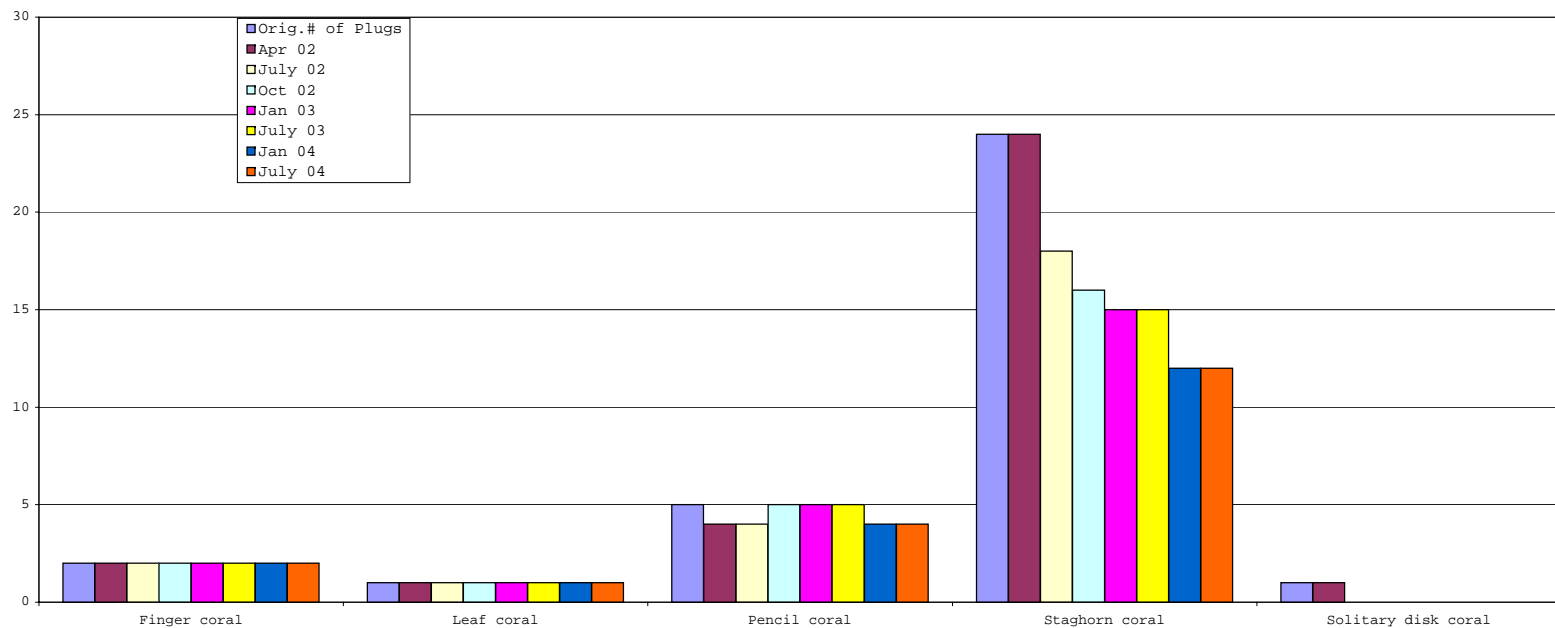
Coral plug mortality chart 1

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	
Coral Species	Orig.# of Plugs	Number of Live Plugs	Mortality 15 days	Number of Live Plugs	Mortality 15 days	Number of Live Plugs	Mortality 15 days	Number of Live Plugs	Mortality 15 days
Finger coral	2	2	0%	2	0%		100%		100%
Leaf coral	1	1	0%	1	0%		100%		100%
Pencil coral	5	4	20%	4	20%		100%		100%
Staghorn coral	24	12	50%	12	50%		100%		100%
Solitary disk coral	1	0	100%	0	100%		100%		100%
		Mean		Mean		Mean		Mean	
<b>TOTALS</b>	<b>33</b>	<b>19</b>	<b>42%</b>	<b>19</b>	<b>42%</b>	<b>0</b>	<b>100%</b>	<b>0</b>	<b>100%</b>

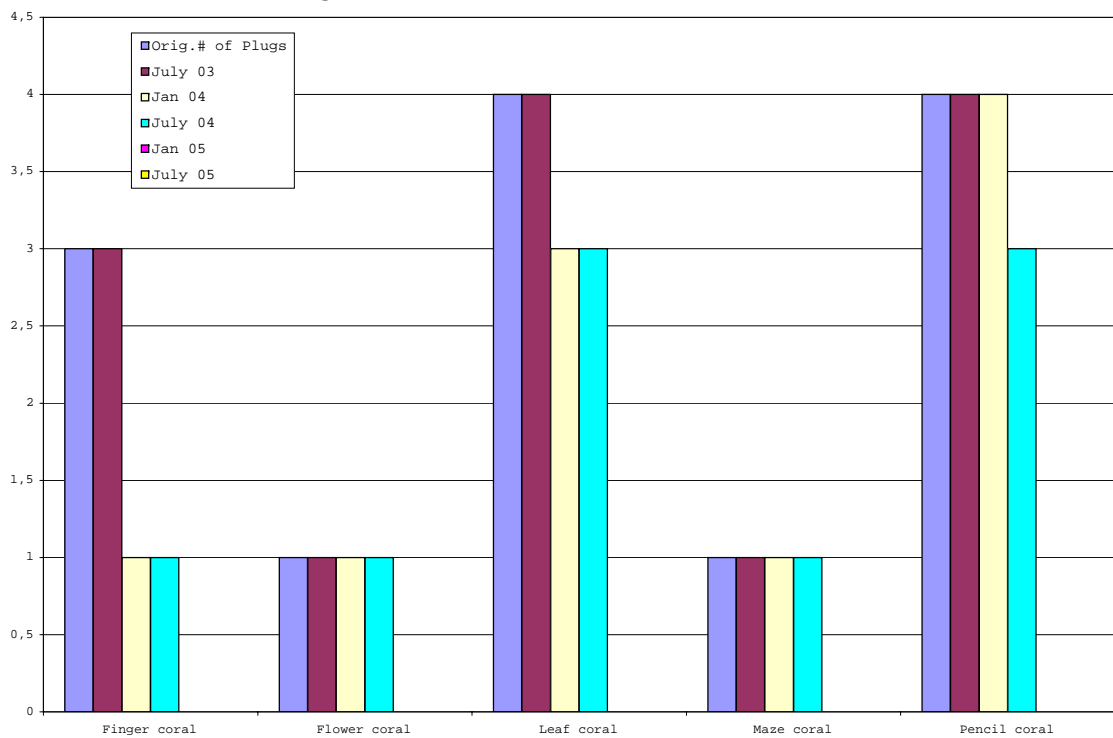
Coral Plug Survival Chart East Side Reef Balls Cluster 12



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	
		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%				
Flower coral	1	1	0%	1	0%	1	0%				
Leaf coral	4	4	0%	3	25%	3	25%				
Maze coral	1	1	0%	1	0%	1	0%				
Pencil coral	4	4	0%	4	0%	3	25%				
Star coral	4	4	0%	4	0%	4	0%				
Sea rod black	3	3	0%	3	0%	3	0%				
Sea rod white	1	1	0%	1	0%	1	0%				
			Mean		Mean		Mean		Mean		Mean
<b>TOTALS</b>	<b>21</b>	<b>21</b>	<b>0%</b>	<b>18</b>	<b>14%</b>	<b>17</b>	<b>19%</b>				

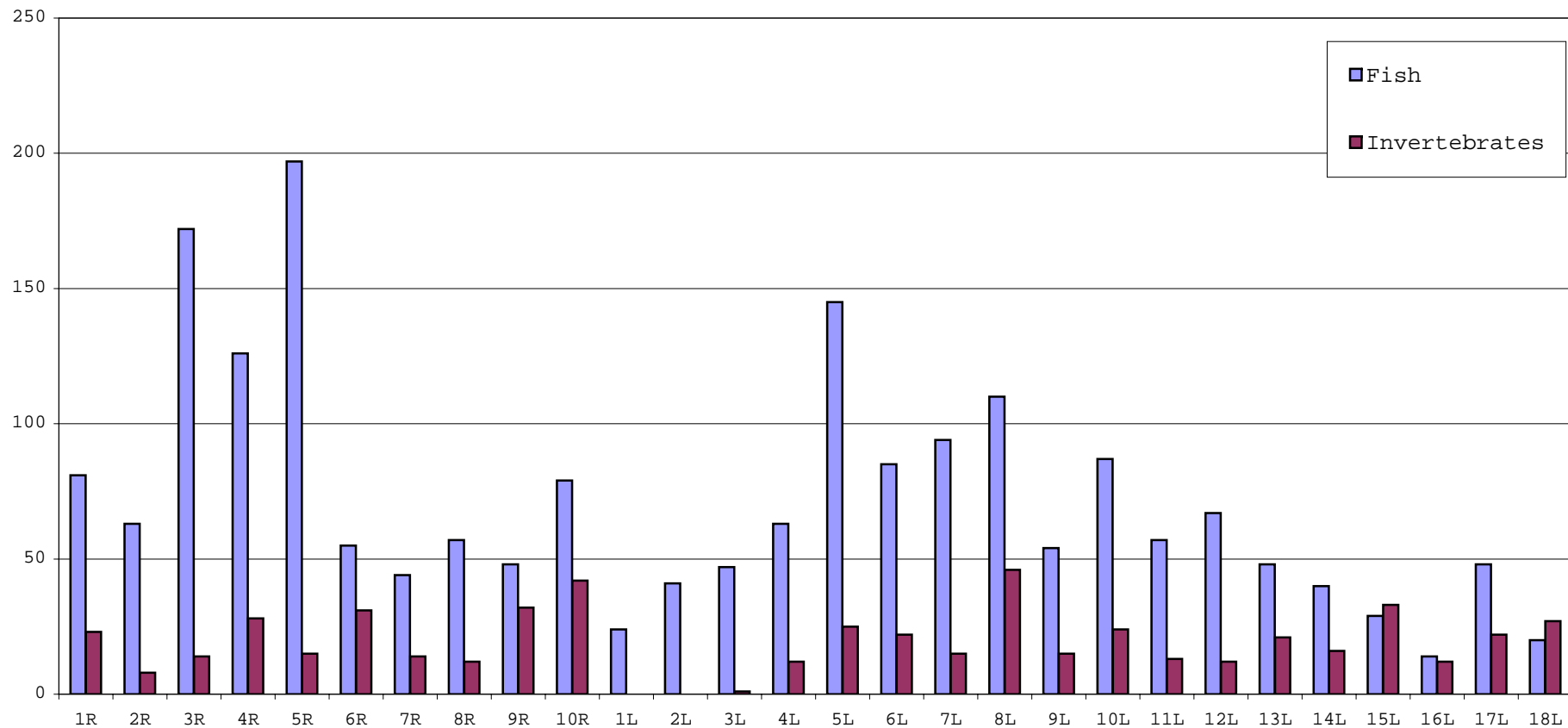
Coral Plug Survival Chart East Side Reef Balls Cluster 18



**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	81	4,06	23	1,50
2R	63	3,16	8	1,50
3R	172	8,62	14	2,62
4R	126	6,32	28	5,23
5R	197	9,87	15	2,80
6R	55	2,76	31	5,79
7R	44	2,21	14	2,62
8R	57	2,86	12	2,24
9R	48	2,41	32	5,98
10R	79	3,96	42	7,85
1L	24	1,20	0	0,00
2L	41	2,06	0	0,00
3L	47	2,36	1	0,19
4L	63	3,16	12	2,24
5L	145	7,27	25	4,67
6L	85	4,26	22	4,11
7L	94	4,71	15	2,80
8L	110	5,51	46	8,60
9L	54	2,71	15	2,80
10L	87	4,36	24	4,49
11L	57	2,86	13	2,43
12L	67	3,36	12	2,24
13L	48	2,41	21	3,93
14L	40	2,01	16	2,99
15L	29	1,45	33	6,17
16L	14	0,70	12	2,24
17L	48	2,41	22	4,11
18L	20	1,00	27	5,05
<b>TOTAL</b>	<b>1995</b>	<b>100</b>	<b>535</b>	<b>97,20</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: June 29, 2004

TIME: 8.00 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.	
<b>FISH</b>															
ANGELFISH	French Angelfish		1	1	1	1			1			5	1,00		
BASSLET	Fairy Basslet														
BLENNY	Redlip Blenny	1		2			1				1	5	1,25	0,50	
	Saddled Blenny						1					1	1,00		
BOXFISH	Spotted Trunkfish								1			1	1,00		
BUTTERFLYFISH	Banded Butterflyfish								2		1	3	1,50	0,71	
	Foureye Butterflyfish						1					1	1,00		
CARDINALFISH	Belted Cardinalfish														
CHROMIS	Blue Chromis														
	Brown Chromis	16	14	12		112						154	38,50	49,03	
DAMSELFISH	Beaugregory		2									2	2,00		
	Bicolor Damselfish	3	2	26	23	11	5	3	2			75	9,38	9,81	
	Cocoa Damselfish			1	1	1				1		4	1,00		
	Dusky Damselfish					5	5	3		2	9	24	4,80	2,68	
	Sergeant Major	32	6						5	6		4	53	10,60	11,99
	Threespot Damselfish														
	Yellowtail Damselfish			1	3	1	2				1	9	1,50	0,84	
DRUM	Spotted Drum										1	1	1,00		
EEL	Spotted Moray														
FILEFISH	Orange Filefish										2	2	2,00		
	Scrawled Filefish				2							2	2,00		
FLOUNDER	Peacock Flounder														
GOATFISH	Spotted Goatfish			1								1	1,00		
	Yellow Goatfish					18						18	18,00		
GOBY	Bridled Goby	7	5		5	6	10	11	20	20	30	114	12,67	8,75	
	Neon Goby							1	1			2	1,00		
GROUPE	Coney														
	Graysby														
	Red Hind						1					1	1,00		
GRUNT	Bluestriped Grunt														
	French Grunt	1	1	72	1	2	1		1	1	3	83	9,22	23,55	
	Smallmouth Grunt										1	1	1,00		
	White Grunt		1									1	1,00		
	White Margate					1						1	1,00		
HAMLET	Butter Hamlet														
HOGFISH	Spanish Hogfish														
JACK	Bar Jack														
	Palometa	2	1			1						4	1,33	0,58	
PARROTFISH	Blue Parrotfish														
	Princess Parrotfish														
	Queen Parrotfish				1	2	1		3		4	11	2,20	1,30	
	Redband Parrotfish			2	2	2			1			7	1,75	0,50	
	Stoplight Parrotfish					1			1		2	4	1,33	0,58	
	Striped Parrotfish			2				1		1	4	1,33	0,58		
PUFFER	Sharpnose Puffer							2	1	1		4	1,33	0,58	
	Porcupine					1						1	1,00		
SCORPIONFISH	Spotted Scorpionfish			2	1	1		1				5	1,25	0,50	
SEABASS	Harlequin Bass									1		1	1,00		
SNAPPER	Gray Snapper														
	Red Snapper														
	Mutton Snapper			1								1	1,00		
SQUIRRELFISH	Blackbar Soldierfish			5			4			2	9	20	5,00	2,94	
	Squirrelfish		1	1			1	1		1	1	6	1,00		
SURGEONFISH	Blue Tang	2	3	2		3			1	1		12	2,00	0,89	
	Doctorfish														
	Ocean Surgeonfish	1			7	3						11	3,67	3,06	
WRASSE	Bluehead Wrasse	9	18	33	62	15	19	14	14	12	8	204	20,40	16,20	
	Clown Wrasse			2	3	1	2			2		10	2,00	0,71	
	Puddingwife	1	3		3	2	3	1			1	14	2,00	1,00	
	Rainbow Wrasse														
	Slippery Dick	5	5	5	10	4						29	5,80	2,39	
	Yellowhead Wrasse								1	1		2	1,00		
OTHERS	Lizardfish, Bluestriped														
	Mojarra, Yellowfin														
	Soapfish, Greater	1		1		1					1	4	1,33		
	Trumpetfish				1			1			2	4	1,33	0,58	
<b>TOTAL</b>		<b>81</b>	<b>63</b>	<b>172</b>	<b>126</b>	<b>197</b>	<b>55</b>	<b>44</b>	<b>57</b>	<b>48</b>	<b>79</b>	<b>922</b>	<b>92,2</b>		
<b>INVERTEBRATES</b>															
												<b>Total</b>	<b>Mean</b>	<b>St.Dev.</b>	
ANEMONE	Corkscrew Anemone			1				1	4	8	4	18	3,60	2,88	
	Knobby Anemone	4	2	3	3	2	1		1		1	17	2,13	1,13	
	Giant Anemone					2	5	1			6	14	3,50	2,38	
ENCHINODERMS	Pencil Urchin														
	Longspined Sea Urchin	2	2		2							6	2,00		
CRUSTACEANS	Banded Coral Shrimp				2				1	1		4	1,33	0,58	
	Pederson Cleaner Shrimp										1	1	1,00		
	Nimble Spray Crab				5		1					6	3,00	2,83	
	Yellowline Arrow Crab														
TUBE WORMS	Christmas Tree Worm	14	2	6	13	4	17	7	1	14	11	89	8,90	5,63	
	Ghost Feather Duster									1	1	2	1,00		
	Magnificent Feather D.			1								1	1,00		
	Split Crown Feather D.					1	5	1	1	2	2	12	2,00	1,55	
	Star Horseshoe Worm											9	9,00		
	Variagated Feather D.														
MOLLUSKS	Amber Penshell									2		2	2,00		
	Atlantic Pearl Oyster														
	File Clam														
SPONGES	Lumpy Overgrowing Sponge	3	2	3	3	6	2	4	4	4	7	38	3,80	1,62	
<b>TOTAL</b>		<b>23</b>	<b>8</b>	<b>14</b>	<b>28</b>	<b>15</b>	<b>31</b>	<b>14</b>	<b>12</b>	<b>32</b>	<b>42</b>	<b>219</b>	<b>21,9</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 EAS

DATE: June 30, 2004

Data collected and recorded by: Marjo van den Bulck

TIME: 08:30 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	2.1m	2.4m	2.7m	3.2m	3.4m	4.3m	4.3m	4.3m	4.3m	4.3m	4.3m	4.3m				
<b>ANGELFISH</b>	French Angelfish					1				1									2	1,00		
<b>BLENNY</b>	Redlip Blenny	1	1	1	1			2	1	1	1								9	1,13	0,35	
	Saddled Blenny			1	1	1			2										5	1,25	0,50	
	Spiny Head Blenny																					
<b>BOXFISH</b>	Smooth Trunkfish										1			1				1	3	1,00		
	Spotted Trunkfish										1	1					1		3	1,00		
<b>BUTTERFLYFISH</b>	Banded Butterflyfish							1											1	1,00		
	Foureye Butterflyfish													1					1	1,00		
<b>CARDINALFISH</b>	Belted Cardinalfish																					
<b>CHROMIS</b>	Brown Chromis					100	58	48	13	1	2		1						223	31,86	38,16	
<b>DAMSELFISH</b>	Beaugregory Damselfish	1	4	1				1											7	1,75	1,50	
	Bicolor Damselfish		5	6	12	6		10	2	4	16	8	5	10	3				87	7,25	4,09	
	Cocoa Damselfish			2	1			3	2		3								11	2,20	0,84	
	Dusky Damselfish	6		6	6	5	4			6	4								37	5,29	0,95	
	Sergeant Major	1				1					2	1	6	5	3	4	7	6	2	38	3,45	2,25
	Threespot Damselfish																					
	Yellowtail Damselfish					1	4		4				1						10	2,50	1,73	
<b>EEL</b>	Spotted Moray																					
<b>FILEFISH</b>	Slender Filefish																					
	Orangespotted Filefish										1	1			1				3	1,00		
<b>FLOUNDER</b>	Peacock Flounder																					
<b>GOATFISH</b>	Spotted Goatfish																					
	Yellow Goatfish				14	3							3					3	23	5,75	5,50	
<b>GOBY</b>	Bridled Goby		4	5		10		3	17	30	35	34	20	27	20	5	30	11	261	17,40	11,51	
	Neon Goby						1			1									2	1,00		
<b>GROUWER</b>	Coney	1			3	3	1	2	1	1		2							14	1,75	0,89	
	Graysby																					
	Red Hind		1	1															2	1,00		
<b>GRUNT</b>	Bluestriped Grunt							2			1		1	1					5	1,25	0,50	
	French Grunt	1	1	1	1		1	6	70		1	2	1	1			1		87	7,25	19,81	
	Juvenile Grunt U.I.																					
<b>HAMLET</b>	Butter Hamlet																					
<b>HOGFISH</b>	Spanish Hogfish							1											1	1,00		
<b>JACK</b>	Bar Jack		1																	1	1,00	
<b>PARROTFISH</b>	Princess Parrotfish							1	1	1		2	1					1	7	1,17	0,41	
	Queen Parrotfish	1	4	1	8	2			2			4	2	2				1	27	2,70	2,16	
	Redband Parrotfish				1	2													3	1,50	0,71	
	Redtail Parrotfish																					
	Stoplight Parrotfish				1					1								1	3	1,00		
	Striped Parrotfish																					
<b>PUFFER</b>	Porcupinefish		1										1						2	1,00		
	Sharpnose Puffer					1					1		1	1				1	5	1,00		
<b>SCORPIONFISH</b>	Spotted Scorpionfish										1							1	2	1,00		
<b>SEABASS</b>	Harlequin Bass										1								1	1,00		
<b>SNAPPER</b>	Gray Snapper											2	2		1				5	1,67	0,58	
	Red Snapper																					
<b>SQUIRRELFISH</b>	Squirrelfish			1	1	1			1										4	1,00		
<b>SURGEONFISH</b>	Blue Tang		1	1	1			1											4	1,00		
	Doctorfish													1					1	1,00		
	Ocean Surgeonfish	2	1	3	1	3	1		1	5	2	2					1	22	2,00	1,26		
<b>WRASSE</b>	Bluehead Wrasse	5	10	9	9	4	7	5	2	7	22	2			3		6	91	7,00	5,21		
	Clown Wrasse	1	1	4			2			1									9	1,80	1,30	
	Puddingwife	1	2	1	1	1		2		1	1		1					1	12	1,20	0,42	
	Slippery Dick	3	3	3	1			3		8	2								23	3,29	2,21	
	Yellowhead Wrasse										2		2	2	1			2	9	1,80	0,45	
<b>OTHERS</b>	Mojarra, Yellowfin		1									1							2	1,00		
	Sand Diver																					
	Soapfish, Greater										2					1			3	1,50	0,71	
	Trumpetfish								1			1							2	1,00		
<b>TOTAL</b>		24	41	47	63	145	85	94	110	54	87	57	67	48	40	29	14	48	20	1073	59,61	
<b>INVERTEBRATES</b>																			<b>Total</b>	<b>Mean</b>	<b>St. Dev.</b>	
<b>ANEMONE</b>	Corkscrew Anemone					4		2	4	1	6		1	7	4		2	1	32	3,2	2,15	
	Giant Anemone					4			3	1	1		1	5	2	2	2		21	2,3	1,41	
	Knobby Anemone				1	2	2	1		1	2		2		2				13	1,6	0,52	
<b>CRUSTACEANS</b>	Banded Coral Shrimp									1	4									2,5	2,12	
	Nimble Spray Crab				11	9	10	8	4	3	1								46	6,6	3,87	
	Pederson Cleaner Shrimp																					
	Yellowline Arrow Crab					1			1	1	1			1				1	2	8	1,1	0,38
<b>SEGM. WORMS</b>	Bearded Fireworm																					
	Christmas Tree Worm				1	3	9	4	31	3	2	11	7		4	24	7	16	18	140	10,0	9,08
	Ghost Feather Duster								1		3								4	2,0	1,41	
	Star Horse Shoe Worm																					
	Variiegated Fth.Dstr.							1			7		1	4					13	3,3	2,87	
<b>MOLLUSKS</b>	Amber Penshell					1													1	1,0		
	Atlantic Thorny Oyster																					
	Queen Conch																	1	1	1,0		
	Spiny File Clam																					
<b>SPONGES</b>	Lumpy Overgrowing Sponge					1			1	1	1	2		5	5	5	3	2	6	32	2,9	1,97
<b>ECHINODERMS</b>	Blunt-spined Brittle Star																					
	Longspined Sea Urchin			2	9	5	17	22	12	1								2	1	71	7,9	7,69
	West Indian Sea Egg				1														1	1,0		
<b>TOTAL</b>				1	12	25	22	15	46	15	24	13	12	21	16	33	12	22	27	316	17,56	

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