

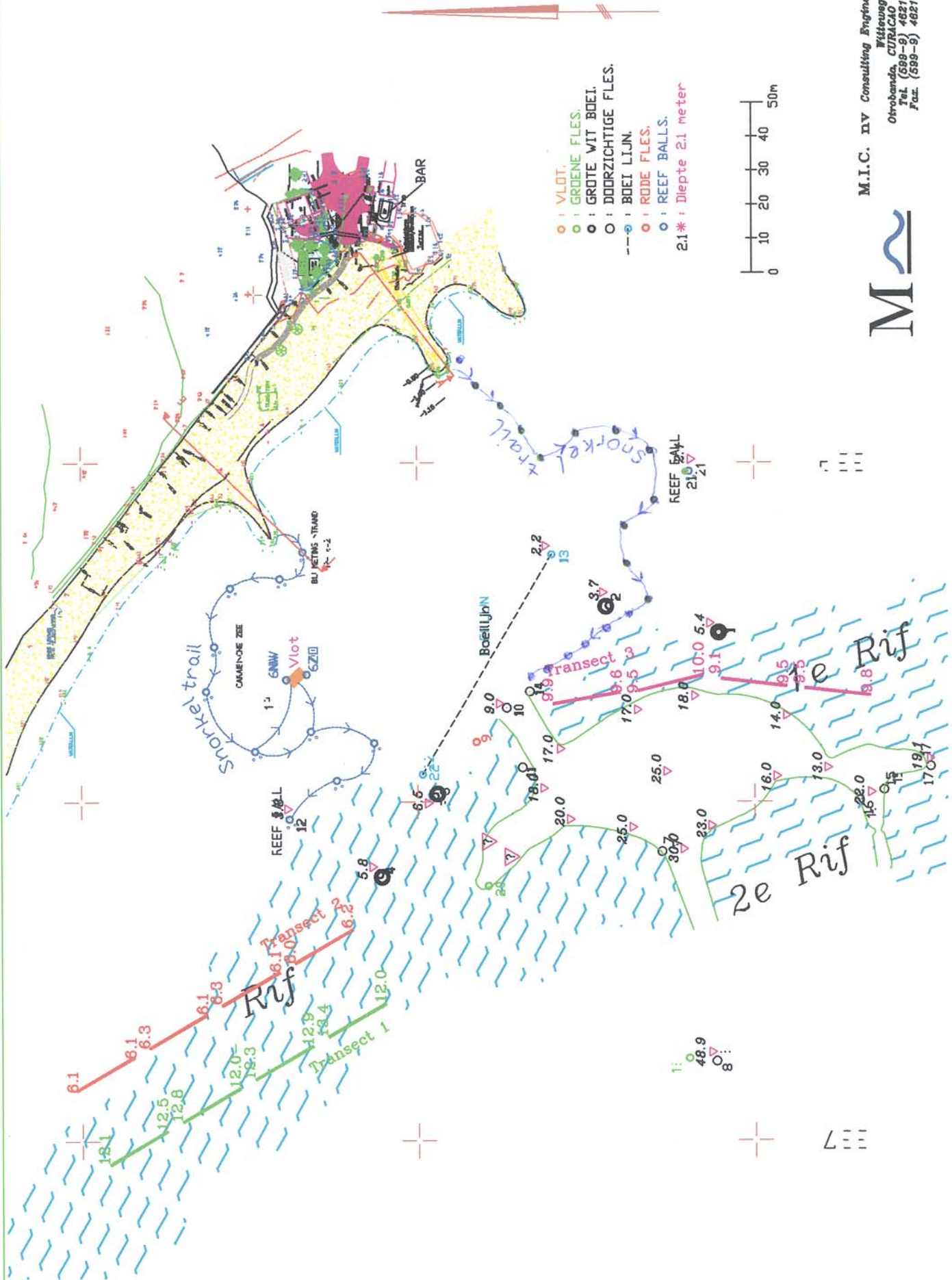
# **PORTOMAREA MARINE MONITORING**

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

by

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**January 2004**



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# PORTOMAREA MARINE MONITORING

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## **PORTOMAREA MARINE MONITORING**

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

Survey dates: January 7 - January 22, 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 went up from 26C to 27C during this monitoring period. Very high temperatures (30C) were reported in the previous months.

Visibility varied from 15m to 30m. Average visibility 25m.

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.

We had to replace one rebar on transect #1, depth 12m.

## **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 some 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.

No Schoolmasters seen on the transects during this survey 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.

Most 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 is added to this rapport as from July 2003.

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

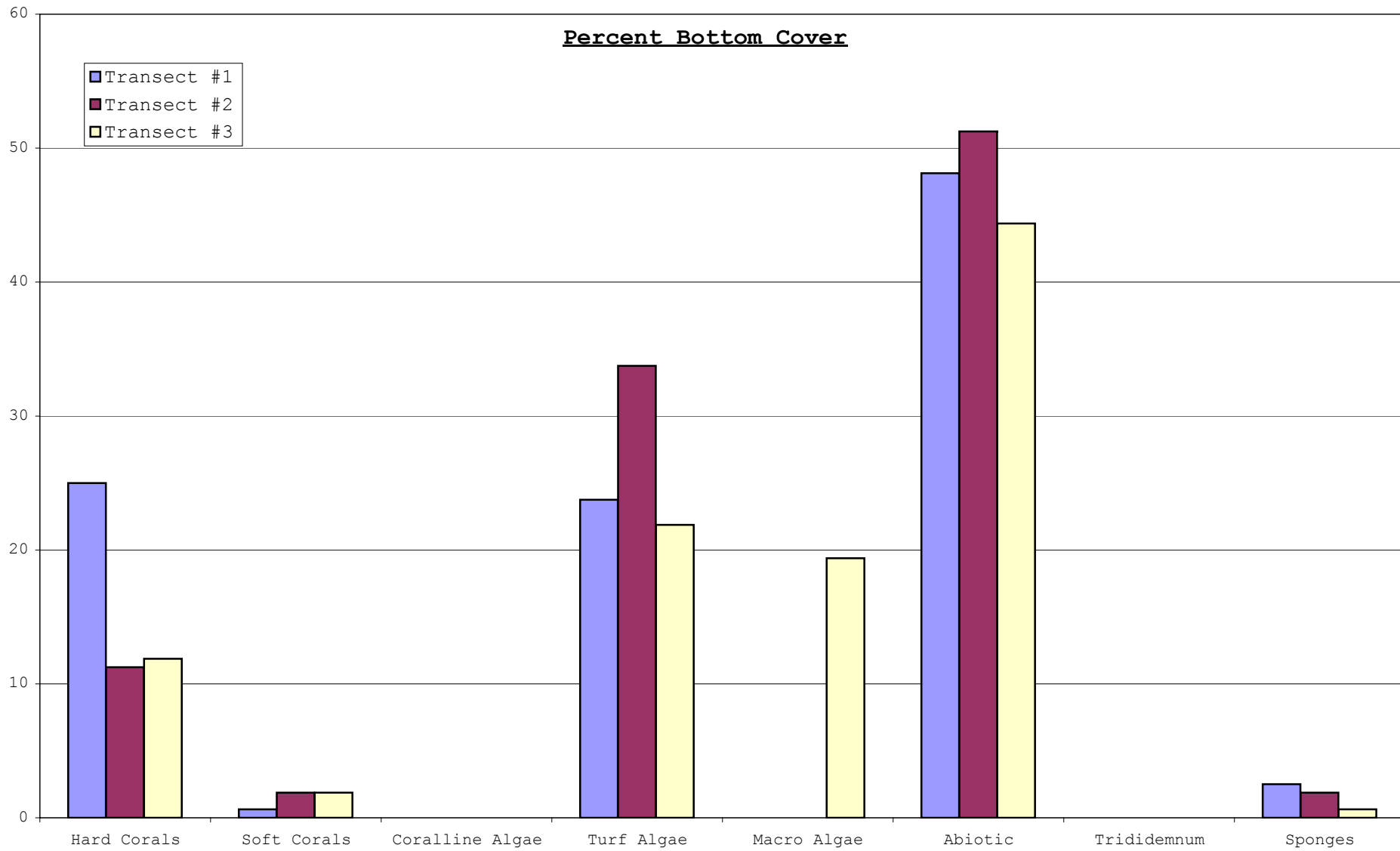
A small school of Grey Snappers was seen on Cluster 18 east during this survey period.

**PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY**

Date : January 2004  
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								
<b>1</b>	<b>12m</b>														
	0-20m	13	12	0	1	0	0	0	0	9	0	17	0	1	40
	25-45m	16	15	0	1	0	0	0	0	9	0	13	0	2	40
	50-70m	7	7	0	0	0	0	1	0	9	0	23	0	0	40
	75-95m	4	4	0	0	0	0	0	0	11	0	24	0	1	40
	Mean	10	10	0	1	0	0	0	0	10	0	19	0	1	40
	% cover	25	95	0	5	0	0	1	0	24	0	48	0	3	100
	standard deviation	5,48	4,93	0,00	0,58	0,00	0,00	0,50	0,00	1,00	0,00	5,19	0,00	0,82	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								
<b>2</b>	<b>6m</b>														
	0-20m	2	2	0	0	0	0	0	0	10	0	27	0	1	40
	25-45m	2	2	0	0	0	0	0	0	17	0	20	0	1	40
	50-70m	9	9	0	0	0	0	0	0	10	0	20	0	1	40
	75-95m	5	5	0	0	0	0	3	0	17	0	15	0	0	40
	Mean	5	5	0	0	0	0	1	0	14	0	21	0	1	40
	% cover	11	100	0	0	0	0	2	0	34	0	51	0	2	100
	standard deviation	3,32	3,32	0,00	0,00	0,00	0,00	1,50	0,00	4,04	0,00	4,93	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								
<b>3</b>	<b>10m</b>														
	0-20m	10	9	1	0	0	0	2	0	6	7	15	0	0	40
	25-45m	1	1	0	0	0	0	1	0	9	8	21	0	0	40
	50-70m	2	2	0	0	0	0	0	0	7	11	19	0	1	40
	75-95m	6	6	0	0	0	0	0	0	13	5	16	0	0	40
	Mean	5	5	0	0	0	0	1	0	9	8	18	0	0	40
	% cover	12	95	5	0	0	0	2	0	22	19	44	0	1	100
	standard deviation	4,11	3,70	0,50	0,00	0,00	0,00	0,96	0,00	3,10	2,50	2,75	0,00	0,50	0,00

PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT SUMMARY

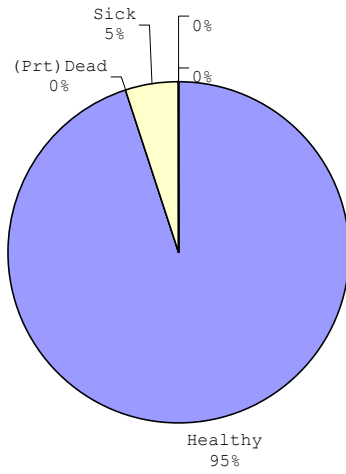




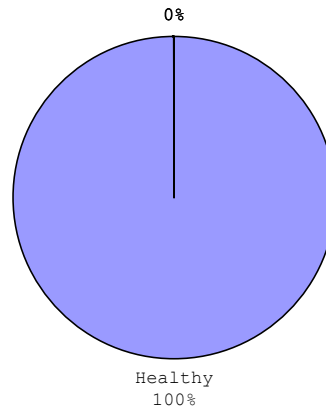
PORTOMAREA MARINE MONITORING

CORAL LINE TRANSECTS - CORAL HEALTH CHART

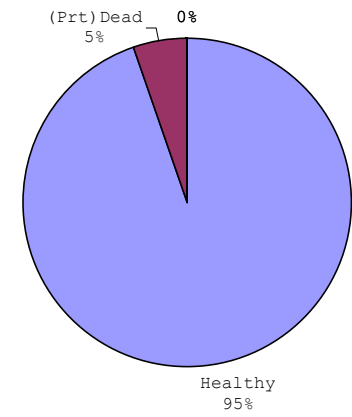
Transect 1, Depth 12m



Transect 2, Depth 6m



Transect 3, Depth 10m



**PORTOMAREA MARINE MONITORING  
CORAL LINE TRANSECT**

Transect No: 1, Depth 12m, Section 0-20m      Visibility: 20 m      Observer: Marjo van den Bulck  
Date: January 14, 2004      Temperature: 26C

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			Boulder						Healthy												
2																	YA				
2,5																	YA				
3			Boulder						Healthy												
3,5			Boulder						Healthy												
4			Boulder						Healthy												
4,5																	TA				
5																	SD				
5,5			Boulder						Sick												
6			Boulder						Healthy												
6,5																	SD				
7																	TA				
7,5																	RC				
8																	RC				
8,5																	RC				
9							Lettuce		Healthy												
9,5																	RB				
10																	SD				
10,5																	TA				
11																	RB				
11,5																	SD				
12																	TA				
12,5																	RC				
13									Flower	Healthy											
13,5			Boulder						Healthy												
14																	TA				
14,5																	RB				
15																	SD				
15,5									Black Sponge		BLA										
16				Brain					Healthy												
16,5																	RB				
17																	BA				
17,5																	YA				
18																	RC				
18,5																	SD				
19			Boulder						Healthy												
19,5		Mustard							Healthy												
20			Boulder						Healthy												
										PD	H	S	BL								
<b>Total</b>	0	1	9	1	0	1	0	1	1	0	12	1	0	0	1	0	0	0	9	17	
	0	4	18	5	1	9	1	2	0	38	2	0		1	4	0	0	0	38	77	<b>GRAND TOTAL</b>

**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: 20 m      Observer: Marjo van den Bulck  
 Date: January 14, 2004      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																RB
1,5																RB
2						Lettuce			Healthy							
2,5				Grooved					Healthy							
3				Grooved					Healthy							
3,5																RC
4																BA
4,5																BA
5																RB
5,5																RC
6														YA		
6,5																RB
7		Mustard							Healthy							
7,5															YA	
8			Boulder						Sick							
8,5					Finger				Healthy							
9			Smooth						Healthy							
9,5																SD
10			Boulder						Healthy							
10,5															YA	
11																RB
11,5						Lettuce			Healthy							
12																YA
12,5																BA
13																BA
13,5																TA
14						Lettuce			Healthy							
14,5			Boulder						Healthy							
15			Boulder						Healthy							
15,5																RB
16																SD
16,5		Mustard							Healthy							
17			Boulder						Healthy							
17,5									Black Sponge		BLA					
18				Brain					Healthy							
18,5						Lettuce			Healthy							
19									Black Sponge		BLA					
19,5																RC
20																RB
<b>Total</b>	0	2	6	3	1	4	0	0		0	2	0	0	0	9	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: 20 m      Observer: Marjo van den Bulck  
 Date: January 14, 2004      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							Fire		Healthy						BA						
1															TA						
1,5																SD					
2															BA						
2,5															YA						
3																					
3,5			Boulder						Healthy												
4								Flower	Healthy												
4,5																RB					
5																RC					
5,5																RC					
6															TA						
6,5						Lettuce			Healthy						TA						
7																					
7,5																SD					
8																SD					
8,5																SD					
9																SD					
9,5																SD					
10																SD					
10,5				Brain					Healthy												
11			Boulder						Healthy												
11,5															TA						
12															YA						
12,5															YA						
13																RB					
13,5																RB					
14																RB					
14,5									Purple Sea Rod	PU											
15																RB					
15,5																RB					
16						Lettuce			Healthy												
16,5																RC					
17																SD					
17,5																SD					
18																RB					
18,5																RB					
19																SD					
19,5																SD					
20																SD					
<b>Total</b>	0	0	2	1	0	2	1	1	1	0	7	0	0	1	0	0	0	0	0	9	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: 1, Depth 12m, Section 75-95m      Visibility: 20 m      Observer: Marjo van den Bulck  
 Date: January 14, 2004      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																SD	
2																RC	
2,5																RB	
3																RC	
3,5															BA		
4															TA		
4,5																RC	
5			Boulder						Healthy								
5,5																SD	
6															TA		
6,5																SD	
7															YA		
7,5															YA		
8															TA		
8,5																SD	
9																SD	
9,5															BA		
10						Lettuce			Healthy								
10,5															YA		
11															BA		
11,5																SD	
12						Lettuce			Healthy								
12,5		Mustard							Healthy								
13									Elephants Ear		OR						
13,5																SD	
14																RB	
14,5																RC	
15															BA		
15,5																SD	
16																SD	
16,5																SD	
17																SD	
17,5															YA		
18																RC	
18,5																SD	
19																SD	
19,5																SD	
20																SD	
<b>Total</b>	0	1	1	0	0	2	0	0	0	0	4	0	0	0	0	11	24

**Substrate Codes:**

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

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 2, Depth 6m, Section 0-20m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: January 16, 2004      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																RB
1,5																TA
2																RB
2,5				Brain					Healthy							
3																TA
3,5																SD
4																RC
4,5																SD
5																TA
5,5																TA
6																TA
6,5									Black Ball Sponge		BLA					
7																RB
7,5																RB
8																TA
8,5																SD
9																SD
9,5																RB
10		Maze							Healthy							
10,5																RB
11																RC
11,5																TA
12																TA
12,5																SD
13																RC
13,5																TA
14																SD
14,5																RB
15																SD
15,5																SD
16																RB
16,5																SD
17																TA
17,5																RB
18																RC
18,5																RB
19																RB
19,5																RB
20																SD
<b>Total</b>	0	1	0	1	0	0	0	0	0	0	0	0	0	0	10	27
	0	3	7	5	0	1	2	0	0	18	0	0	3	3	0	0
																<b>GRAND TOTAL</b>

**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 25-45m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: January 16, 2004      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		Mustard							Healthy								
1														BA			
1,5														BA			
2															RC		
2,5															RB		
3														TA			
3,5															SD		
4															RB		
4,5															RB		
5		Maze							Healthy								
5,5														TA			
6														YA			
6,5															SD		
7															RB		
7,5														TA			
8														TA			
8,5															SD		
9															RB		
9,5															RB		
10															RB		
10,5														TA			
11														TA			
11,5														TA			
12															RC		
12,5														YA			
13															RB		
13,5															SD		
14														YA			
14,5														YA			
15															RB		
15,5															RB		
16									Black Sponge		BLA						
16,5														TA			
17														TA			
17,5														TA			
18															RB		
18,5															RB		
19														YA			
19,5															RC		
20															SD		
<b>Total</b>	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	17	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	BLA	Black
				TR	Trididemnum		

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 2, Depth 6m, Section 50-70m      Visibility: 25 m      Observer: Marjo van den Bulck  
 Date: January 16, 2004      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															BA		
2															SD		
2,5					Lettuce			Healthy									
3															YA		
3,5		Boulder						Healthy									
4															TA		
4,5															SD		
5															RB		
5,5															TA		
6															RB		
6,5															RC		
7															TA		
7,5															RB		
8															RB		
8,5															RB		
9															SD		
9,5															RB		
10															TA		
10,5		Boulder						Healthy									
11															TA		
11,5															RB		
12		Boulder						Healthy									
12,5								Brown Encrusting Octopus Sponge	BRO								
13		Boulder						Healthy									
13,5		Boulder						Healthy									
14		Boulder						Healthy									
14,5															RC		
15															YA		
15,5															SD		
16			Grooved					Healthy									
16,5															RB		
17															TA		
17,5															SD		
18															RC		
18,5															RB		
19															BA		
19,5							Fire	Healthy									
20															SD		
<b>Total</b>	0	0	6	1	0	1	1	0	0	9	0	0	0	0	0	10	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: 25 m      Observer: Marjo van den Bulck  
Date: January 16, 2004      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															TA		
1,5				Brain					Healthy						BA		
2																RB	
2,5																	
3							Fire		Healthy								
3,5															YA		
4									Purple Sea Rod	PU							
4,5															YA		
5									Purple Sea Rod	PU							
5,5									Purple Sea Rod	PU							
6															YA		
6,5				Grooved					Healthy								
7				Grooved					Healthy								
7,5															YA		
8																RB	
8,5																SD	
9																SD	
9,5																RB	
10																RB	
10,5																SD	
11															TA		
11,5															TA		
12															TA		
12,5																RB	
13																SD	
13,5																SD	
14															TA		
14,5															TA		
15															TA		
15,5															YA		
16															TA		
16,5															YA		
17																RB	
17,5				Boulder					Healthy								
18															YA		
18,5																SD	
19															YA		
19,5																RB	
20																RB	
<b>Total</b>	0	0	1	3	0	0	1	0	0	5	0	0	0	0	0	17	15

**Substrate Codes:**

PD (Partially) Dead	RC Rock	YA Y Algae	BRO Brown
H Healthy	RB Rubble	TA Turf Algae	YE Yellow
S Sick	SD Sand	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: 15 m      Observer: Marjo van den Bulck  
 Date: January 15, 2004      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													TA				
1,5													TA				
2														YA			
2,5	Pencil								Dead, partially 50%								
3														YA			
3,5															RC		
4														TA			
4,5														BA			
5															RB		
5,5													TA				
6														TA			
6,5															SD		
7														TA			
7,5														TA			
8																	
8,5															RB		
9				Boulder					Healthy								
9,5				Boulder					Healthy								
10									Encrusting Gorgonian	ENCR							
10,5		Mustard							Healthy								
11							Lettuce		Healthy								
11,5							Lettuce		Healthy								
12															RC		
12,5				Brain					Healthy								
13				Brain					Healthy								
13,5															RB		
14															SD		
14,5													TA				
15															RB		
15,5									Purple Sea Rod	PU							
16															RB		
16,5															RB		
17														TA			
17,5				Boulder					Healthy								
18				Boulder					Healthy								
18,5																SD	
19															RB		
19,5													TA				
20																SD	
<b>Total</b>	1	1	4	2	0	2	0	0	0	1	9	0	0	0	7	6	15
	1	1	11	3	0	2	1	0	1	18	0	0	0	31	35	71	<b>GRAND TOTAL</b>

**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: 15 m      Observer: Marjo van den Bulck  
 Date: January 15, 2004      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															TA		
1,5																SD	
2																SD	
2,5																RB	
3																SD	
3,5															TA		
4																SD	
4,5																RB	
5																SD	
5,5																SD	
6			Boulder						Healthy								
6,5															TA		
7																SD	
7,5																RB	
8															TA		
8,5																SD	
9																RB	
9,5																SD	
10																SD	
10,5																TA	
11																BA	
11,5																BA	
12																RC	
12,5															TA		
13									Encrusting Gorgonian	ENCR							
13,5																RB	
14																TA	
14,5																TA	
15																TA	
15,5																TA	
16																TA	
16,5																TA	
17																TA	
17,5																YA	
18																TA	
18,5																RB	
19																SD	
19,5																RB	
20																RB	
<b>Total</b>	0	0	1	0	0	0	0	0	0	0	1	0	0	0	8	9	21

**Substrate Codes:**

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

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

Transect No: 3, Depth 10m, Section 50-70m      Visibility: 15 m      Observer: Marjo van den Bulck  
 Date: January 15, 2004      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			Boulder						Healthy											
1,5												TA								
2									Orange Sponge	OR										
2,5																SD				
3																SD				
3,5																RB				
4												TA								
4,5													TA							
5																SD				
5,5														TA						
6														BA						
6,5																RC				
7																SD				
7,5																SD				
8																				
8,5														BA						
9																RB				
9,5														TA						
10																SD				
10,5												TA								
11												TA								
11,5												TA								
12																SD				
12,5												TA								
13												TA								
13,5																SD				
14																SD				
14,5												TA								
15																SD				
15,5												TA								
16																RC				
16,5							Fire		Healthy											
17																RC				
17,5																SD				
18																SD				
18,5														TA						
19														TA						
19,5																SD				
20												TA								
<b>Total</b>	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	11	7	19

**Substrate Codes:**

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

**PORTOMAREA MARINE MONITORING**

**CORAL LINE TRANSECT**

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

**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-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		2	1	3	1,00	1,00
	French Angelfish	2	2		4	2,00	
	Queen Angelfish						
	Rock Beauty			1	1	1,00	
BASSLET	Fairy Basslet	5			5	5,00	
BLENNY	Redlip Blenny						
BOXFISH	Honeycomb Cowfish						
	Smooth Trunkfish	1	1	1	3	1,00	
	Spotted Trunkfish						
BUTTERFLYFISH	Banded Butterflyfish			2	2	2,00	
	Foureye Butterflyfish		3		3	3,00	
	Longsnout Butterflyfish						
CHROMIS	Blue Chromis	60		18	78	39,00	29,70
	Brown Chromis	704	226	870	1800	600,00	334,36
DAMSELFISH	Beaugregory Damselfish			1	1	1,00	
	Bicolor Damselfish	170	260	241	671	223,67	47,44
	Cocoa Damselfish		20	7	27	13,50	9,19
	Dusky Damselfish		17	13	30	15,00	2,83
	Sergeant Major		5	4	9	4,50	0,71
	Threespot Damselfish	112	25	24	161	53,67	50,52
	Yellowtail Damselfish		1		1	1,00	
DRUM	Spotted Drum	2			2	2,00	
EEL	Goldentail Moray						
	Sharptail Eel			1	1	1,00	
	Spotted Moray		1		1	1,00	
FILEFISH	Orangespotted Filefish	1			1	1,00	
FLOUNDER	Peacock Flounder	1			1	1,00	
GOATFISH	Spotted Goatfish	1			1	1,00	
	Yellow Goatfish	22	2	4	28	9,33	11,02
GOBY	Bridled Goby	118	80	109	307	102,33	19,86
	Neon Goby		5	1	6	3,00	2,83
	Peppermint Goby	6	8	22	36	12,00	8,72
GROUPE	Coney		6	5	11	5,50	0,71
	Graysby	11	2	5	18	6,00	4,58
	Rock Hind						
	Tiger Grouper						
GRUNT	Bluestriped Grunt	1		1	2	1,00	
	French Grunt	2	4	4	10	3,33	1,15
	Smallmouth Grunt	62	1	1	64	21,33	35,22
HAMLET	Barred Hamlet	1	1	1	3	1,00	
	Black Hamlet						
	Butter Hamlet		2		2	2,00	
	Yellowtail Hamlet	4	1	2	7	2,33	1,53
HOGFISH	Spanish Hogfish		1	1	2	1,00	
JACK	Bar Jack	1			1	1,00	
MACKEREL	Cero		1		1	1,00	
PARROTFISH	Blue Parrotfish			1	1	1,00	
	Princess Parrotfish	38	18	28	84	28,00	10,00
	Queen Parrotfish	1	9	3	13	4,33	4,16
	Redband Parrotfish	6	6	4	16	5,33	1,15
	Stoplight Parrotfish	22	4	3	29	9,67	10,69
	Striped Parrotfish	20	4	23	47	15,67	10,21
PUFFER	Balloonfish						
	Sharpnose Puffer	7	5	6	18	6,00	1,00
RAY	Southern Stingray			1	1	1,00	
SCORPIONFISH	Spotted Scorpionfish	1			1	1,00	
SEABASS	Creolefish		30		30	30,00	
	Harlequin Bass	10	4	6	20	6,67	3,06
	Tobaccofish		1		1	1,00	
SNAPPER	Mahogany Snapper						
	Schoolmaster						
	Yellowtail Snapper			1	1	1,00	
SQUIRRELFISH	Blackbar Soldierfish	4	5	17	26	8,67	7,23
	Squirrelfish	8	2	12	22	7,33	5,03
SURGEONFISH	Blue Tang	2	3	4	9	3,00	1,00
	Doctorfish			2	2	2,00	
	Ocean Surgeon			1	1	1,00	
WRASSE	Bluehead Wrasse	8	141	22	171	57,00	73,08
	Clown Wrasse		5	1	6	3,00	2,83
	Creole Wrasse			1	1	1,00	
	Rainbow Wrasse		16		16	16,00	
	Slippery Dick		1	1	2	1,00	
	Yellowhead Wrasse	34	23	41	98	32,67	9,07
OTHERS	Cornetfish						
	Hawkfish, Redspotted						
	Sand Diver	1	1	2	4	1,33	0,58
	Sand Tilefish						
	Soapfish, Greater	1	1		2	1,00	
	Trumpetfish	5		6	11	5,50	0,71
<b>TOTAL</b>		<b>1454</b>	<b>955</b>	<b>1526</b>	<b>3935</b>	<b>1311,67</b>	
Invertebrates		Transect 1 Depth:12m	Transect 2 Depth: 6m	Transect 3 Depth:10m	Total	Mean	St.Dev.
ANEMONE	Carpet Anemone				3	1,50	0,71
	Corkscrew Anemone	2	1		3	1,50	
	Giant Anemone	2	27	11	40	13,33	12,66
	Knobby Anemone	36	21	28	85	28,33	7,51
TUBE WORMS	Christmas tree Worms	163	384	233	780	260,00	112,95
	Ghost Feather Duster	5	13	2	20	6,67	5,69
	Magnificent Feather Duster	2	1	1	4	1,33	0,58
	Social Feather Duster						
	Split Crown Feather Duster	15	55	15	85	28,33	23,09
	Star Horseshoe Worm	1	5		6	3,00	2,83
	Variagated Feather Duster	10		7	17	8,50	2,12
CRUSTACEANS	Banded Coral Shrimp	1			1	1,00	
	Heremite Crab						
	Pederson Cleaner Shrimp	6	7	13	26	8,67	3,79
	Red Snapping Cleaner Shrimp	2	1	5	8	2,67	2,08
	Yellowline Arrow Crab	1			1	1,00	
MOLLUSKS	Amber Pen Shell			2	2	2,00	
	Atlantic Thorny-oyster		1		1	1,00	
	Queen Conch		3		3	3,00	
ECHINODERMS	Reef Urchin	1			1	1,00	
<b>TOTAL</b>		<b>246</b>	<b>519</b>	<b>318</b>	<b>1074,00</b>	<b>361,00</b>	

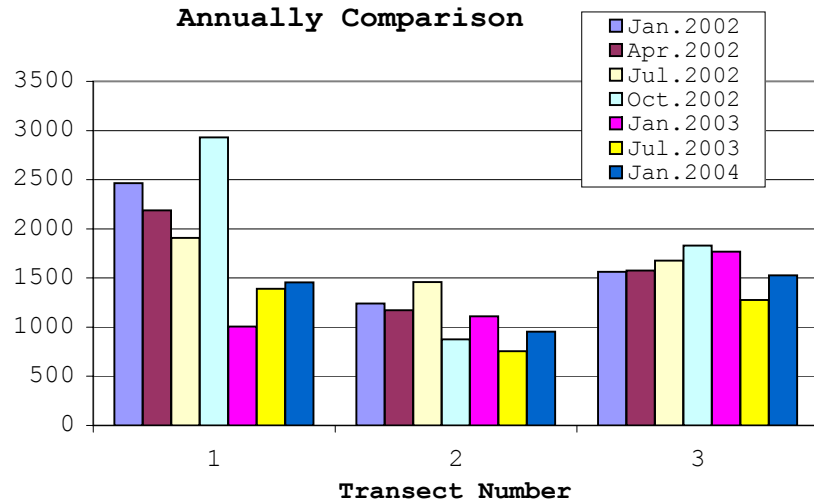
**PORTOMAREA MARINE MONITORING  
FISH AND INVERTEBRATE QUARTERLY/SEMI-ANNUALLY COMPARISON**

	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

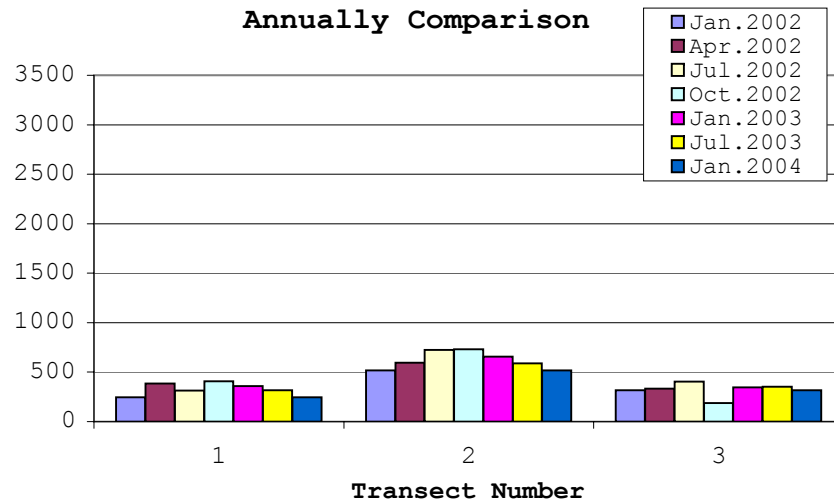
	Transect 1 - Depth 12m			Transect 2 - Depth 6m			Transect 3 - Depth 10m		
	Jan.2003		July 2003	Jan.2003		July 2003	Jan. 2003		July 2003
<b>Fish</b>	1007		1390	1109		754	1767		1276
<b>Invertebrates</b>	359		318	656		588	347		353

	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			955			1526		
<b>Invertebrates</b>	246			519			318		

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

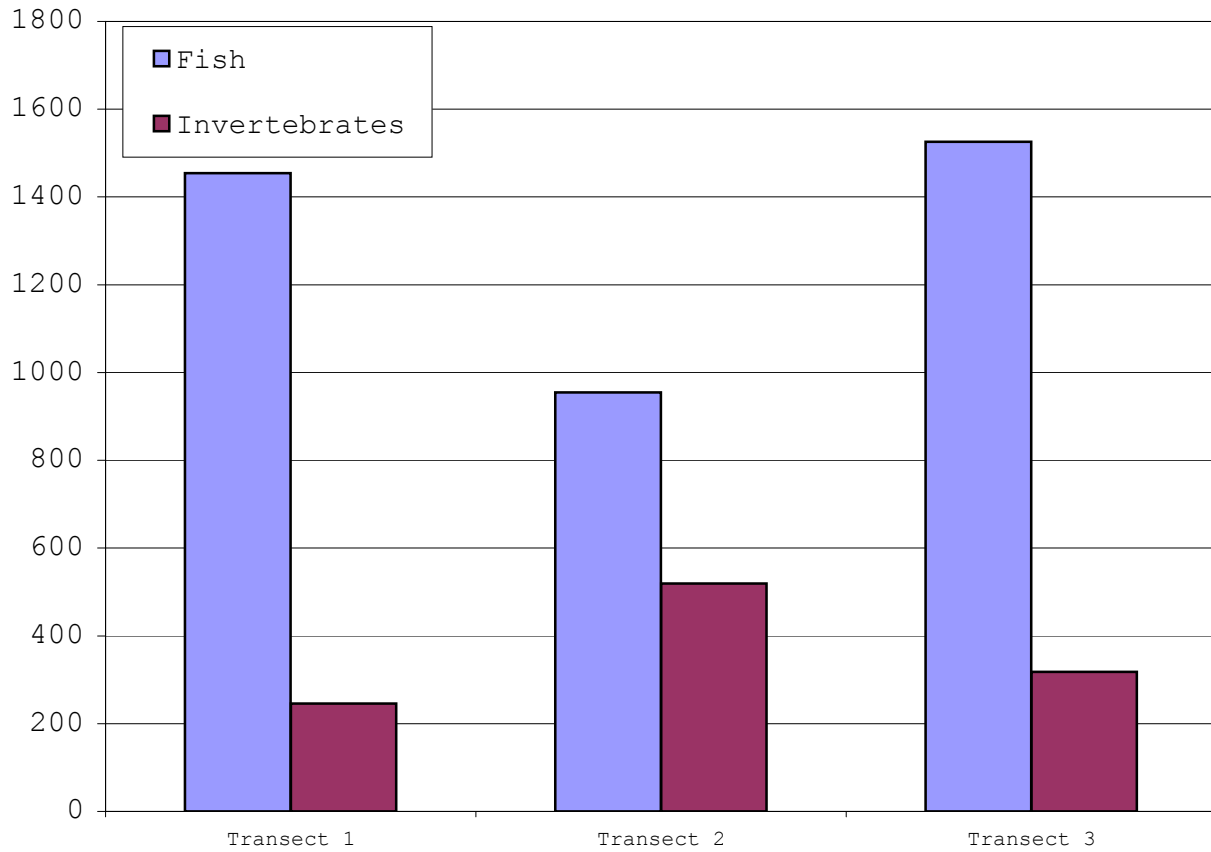


**Invertebrate Population Quarterly/Semi-Annually Comparison**



**PORTOMAREA MARINE MONITORING**  
**ATLANTIC BELT TRANSECT FISH AND INVERTEBRATE SUMMARY**

**Belt Transect Population Summary**





PORTOMAREA MARINE MONITORING

ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

Transect #1, Depth: 12m

Date: January 14, 2002 (Time: 8:23 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							
	French Angelfish	1	1			2	1	
	Rock Beauty							
BASSLET	Fairy Basslet	2	1		2	5	1,67	0,58
BLENNY								
BOXFISH	Smooth Trunkfish				1	1	1,00	
	Honeycomb Cowfish							
BUTTERFLYFISH	Banded Butterflyfish							
	Four-eye Butterflyfish							
	Longsnout Butterflyfish							
CHROMIS	Blue Chromis		14	41	5	60	20,00	18,73
	Brown Chromis	500		4	200	704	234,67	249,81
DAMSELFISH	Bicolor	34	30	56	50	170	42,50	12,48
	Sergeant Major							
	Threespot	60	20	24	8	112	28,00	22,39
	Yellowtail							
DRUM	Spotted Drum			2		2	2	
EEL	Green Moray							
	Spotted Moray							
FILEFISH	Orangespotted Filefish				1	1	1,00	
FLOUNDER	Peacock Flounder	1				1	1	
GOATFISH	Yellow Goatfish	2	8	3	9	22	5,5	3,51
	Spotted Goatfish			1		1	1,00	
GOBY	Bridled Goby	22	23	45	28	118	29,50	10,66
	Neon Goby							
	Peppermint Goby				6	6	6	
GROUPEL	Graysby	4	4	1	2	11	2,75	1,50
	Rock Hind							
GRUNT	Bluestriped Grunt		1			1	1	
	French Grunt	1			1	2	1	
	Smallmouth Grunt	48	5	9		62	20,67	23,76
HAMLET	Barred Hamlet				1	1	1	
	Butter Hamlet							
	Yellowtail Hamlet	1	2	1		4	1,333333	0,58
HOGFISH	Spanish Hogfish							
JACK	Bar Jack							
PARROTFISH	Blue Parrotfish							
	Princess Parrotfish	10	15	5	8	38	9,5	4,20
	Queen Parrotfish	1				1	1	
	Redband Parrotfish		2	2	2	6	2,00	
	Stoplight Parrotfish	7	3	6	6	22	5,5	1,73
	Striped Parrotfish	6		2	12	20	6,67	5,03
PUFFER	Balloonfish							
	Sharpnose Puffer	2	4	1		7	2,333333	1,53
SCORPIONFISH	Spotted Scorpionfish				1	1	1	
SEABASS	Creole Fish							
	Harlequin Bass	4	2	2	2	10	2,5	1,00
SNAPPER	Schoolmaster							
	Yellowtail Snapper							
SQUIRRELFISH	Blackbar Soldierfish	1		3		4	2,00	1,41
	Squirrelfish	5	2		1	8	2,666667	2,08
SURGEONFISH	Blue Tang				2	2	2	
	Doctorfish							
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	5			3	8	4	1,41
	Clown Wrasse							
	Creole Wrasse							
	Slippery Dick							
	Yellowhead Wrasse	8	6	10	10	34	8,50	1,91
OTHERS	Sand Diver				1	1	1	
	Soapfish, greater			1		1	1,00	
	Trumpetfish	2	2	1		5	1,666667	0,58
<b>TOTAL</b>		<b>727</b>	<b>145</b>	<b>220</b>	<b>362</b>	<b>1454</b>	<b>363,50</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			2		2	2,00	
	Knobby Anemone	17	5	8	6	36	9	5,48
TUBE WORMS	Christmas tree Worms	39	37	27	60	163	40,75	13,87
	Ghost Feather Duster	2		2	1	5	1,666667	0,58
	Magnificent Feather Duster		1		1	2	1,00	
	Split Crown Feather Duster	2	1	5	7	15	3,75	2,75
	Star Horseshoe Worm				1	1	1	
	Variegated Feather Duster			3	7	10	5,00	2,83
CRUSTACEANS	Pederson Cleaner Shrimp	5		1		6	3	2,83
	Red Snapping Cleaner Shrimp		2			2	2	
	Yellowline Arrow Crab			1		1	1	
MOLLUSKS	Rough File Clam							
	Queen Conch							
ECHINODERMS	Reef Urchin				1	1	1,00	
<b>TOTAL</b>		<b>66</b>	<b>46</b>	<b>50</b>	<b>84</b>	<b>246</b>	<b>61,5</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: January 15, 2002 (Time: 8:27 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		2			2	2,00	
	French Angelfish		1		1	2	1,00	
	Rock Beauty							
BASSLET								
BIGEYE								
BLENNY	Redlip Blenny							
BOXFISH	Smooth Trunkfish			1		1	1,00	
	Spotted Trunkfish							
BUTTERFLYFISH	Banded Butterflyfish							
	Foureye Butterflyfish			1	2	3	1,50	0,71
	Longsnout Butterflyfish							
CARDINALFISH								
CHROMIS	Blue Chromis							
	Brown Chromis	50		126	50	226	75,33	43,88
DAMSELFISH	Bicolor Damsel	69	74	47	70	260	65,00	12,19
	Cocoa Damsel	5	4	5	6	20	5,00	0,82
	Dusky Damsel	1	2	11	3	17	4,25	4,57
	Sergeant Major				5	5	5,00	
	Threespot Damsel	3	2	20		25	8,33	10,12
	Yellowtail Damsel	1				1	1,00	
DRUM								
EEL	Goldentail Moray							
	Spotted Moray	1				1	1,00	
FILEFISH	Orangespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish				2	2	2,00	
GOBY	Bridled Goby	30	5	20	25	80	20,00	10,80
	Neon Goby	1	2		2	5	1,67	0,58
	Peppermint Goby	4	1	3		8	2,67	1,53
GROUPE	Coney		6			6	6,00	
	Grasby	2				2	2,00	
GRUNT	Bluestriped Grunt							
	French Grunt	1	2		1	4	1,33	0,58
	Smallmouth Grunt				1	1	1,00	
HAMLET	Barred Hamlet	1				1	1,00	
	Butter Hamlet			1	1	2	1,00	
	Yellowtail Hamlet	1				1	1,00	
HOGFISH	Spanish Hogfish		1			1	1,00	
JACK	Bar Jack		1			1	1,00	
MACKEREL	Cero				1	1	1,00	
PARROTFISH	Princess Parrotfish	9	2		7	18	6,00	3,61
	Queen Parrotfish	3	2	1	3	9	2,25	0,96
	Redband Parrotfish	2		3	1	6	2,00	1,00
	Stoplight Parrotfish	1		1	2	4	1,33	0,58
	Striped Parrotfish	3		1		4	2,00	1,41
PUFFER	Sharpnose Puffer	1		2	2	5	1,67	0,58
RAY								
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creole Fish				30	30	30,00	
	Harlequin Bass	2	2			4	2,00	
	Tobaccofish		1			1	1,00	
SQUIRRELFISH	Blackbar Soldier	2		1	2	5	1,67	0,58
	Squirrelfish	1			1	2	1,00	
SURGEONFISH	Blue Tang	2		1		3	1,50	0,71
	Ocean Surgeon							
WRASSE	Bluehead Wrasse	6	51	2	82	141	35,25	38,27
	Clown Wrasse		3		2	5	2,50	0,71
	Rainbow Wrasse				16	16	16,00	
	Slippery Dick		1			1	1,00	
	Yellowhead Wrasse	4	8	2	9	23	5,75	3,30
OTHERS	Redspotted Hawkfish							
	Lizardfish							
	Sand Diver			1		1	1,00	
	Soapfish, Greater		1			1	1,00	
	Trumpetfish							
<b>TOTAL</b>		<b>206</b>	<b>172</b>	<b>250</b>	<b>327</b>	<b>955</b>	<b>238,75</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							
	Corkscrew Anemone	1				1	1,00	
	Giant Anemone	8	6	3	10	27	6,75	2,99
	Knobby Anemone	6	2	8	5	21	5,25	2,50
TUBE WORMS	Christmas tree Worms	71	20	214	79	384	96,00	82,89
	Ghost Feather Duster		6	4	3	13	4,33	1,53
	Magnificent Feather Duster	1				1	1,00	
	Social Feather Duster							
	Split Crown Feather Duster	2	5	41	7	55	13,75	18,28
	Star Horseshoe Worm	2	2		1	5	1,67	0,58
CRUSTACEANS	Variegated Feather Duster							
	Red Snapping Cleaner Shrimp			1		1	1,00	
	Pederson Cleaner Shrimp	3	1		3	7	2,33	1,15
MOLLUSKS	Yellowline Arrow Crab							
	Atlantic Thorny-oyster			1		1	1,00	
	Queen Conch	1	2			3	1,50	0,71
ECHINODERMS	Rough Fileclam							
	Reef Urchin							
<b>TOTAL</b>		<b>95</b>	<b>44</b>	<b>272</b>	<b>108</b>	<b>519</b>	<b>129,75</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 15, 2002 (Time: 9:30 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	1				1	1,00	
	French Angelfish							
	Rock Beauty	1				1	1,00	
BARRACUDA								
BASSLET	Fairy Basslet							
BIGEYE								
BLENNY								
BOXFISH	Honeycomb Cowfish							
	Smooth Trunkfish	1				1	1,00	
BUTTERFLYFISH	Foureye Butterflyfish							
	Banded Butterflyfish				2	2	2,00	
CHROMIS	Blue Chromis	7	9		2	18	6,00	3,61
	Brown Chromis	120	500	200	50	870	217,50	198,05
	Sunshinefish							
DAMSELFISH	Beaugregory Damselfish	1				1	1,00	
	Bicolor Damselfish	70	71	78	22	241	60,25	25,75
	Cocoa Damselfish	1		3	3	7	2,33	1,15
	Dusky Damselfish	1		4	8	13	4,33	3,51
	Sergeant Major			4		4	4,00	
	Threespot Damselfish	17		6	1	24	8,00	8,19
	Yellowtail Damselfish							
DRUM	Spotted Drum							
EEL	Sharptail Eel				1	1	1,00	
	Spotted Moray							
FILEFISH	Orangespotted Filefish							
FLOUNDER	Peacock Flounder							
GOATFISH	Spotted Goatfish							
	Yellow Goatfish	2	2			4	2,00	
GOBY	Bridled Goby	29	30	35	15	109	27,25	8,58
	Neon Goby		1			1	1,00	
	Peppermint Goby	5	7	7	3	22	5,50	1,91
GROUPE	Coney	1			4	5	2,50	2,12
	Graysby	2	1	1	1	5	1,25	0,50
	Rock Hind							
	Tiger Grouper							
GRUNT	Bluestriped Grunt		1			1	1,00	
	French Grunt		1	2	1	4	1,33	0,58
	Smallmouth Grunt	1				1	1,00	
HAMLET	Barred Hamlet		1			1	1,00	
	Butter Hamlet							
	Yellowtail Hamlet	1		1		2	1,00	
HOGFISH	Spanish Hogfish			1		1	1,00	
JACK	Bar Jack							
PARROTFISH	Blue Parrotfish		1			1	1,00	
	Princess Parrotfish	7	9	9	3	28	7,00	2,83
	Queen Parrotfish			3		3	3,00	
	Redband Parrotfish	1		1	2	4	1,33	0,58
	Stoplight Parrotfish	2	1			3	1,50	0,71
	Striped Parrotfish	4	15	2	2	23	5,75	6,24
PUFFER	Sharpnose Puffer	3	2		1	6	2,00	1,00
RAY	Southern Stingray	1				1	1,00	
SCORPIONFISH	Spotted Scorpionfish							
SEABASS	Creolefish							
	Harlequin Bass	1	1	1	3	6	1,50	1,00
SNAPPER	Schoolmaster							
	Yellowtail Snapper	1				1	1,00	
SQUIRRELFISH	Blackbar Soldierfish	9	4	4		17	5,67	2,89
	Squirrelfish	1	2	4	5	12	3,00	1,83
SURGEONFISH	Blue Tang	2		1	1	4	1,33	0,58
	Doctorfish				2	2	2,00	
	Ocean Surgeon	1				1	1,00	
WRASSE	Bluehead Wrasse	1	8		13	22	7,33	6,03
	Clown Wrasse	1				1	1,00	
	Creole Wrasse				1	1	1,00	
	Puddingwife							
	Slippery Dick		1			1	1,00	
	Yellowhead Wrasse	9	16	6	10	41	10,25	4,19
OTHERS	Sand Diver	1			1	2	1,00	
	Trumpetfish	1	2	3		6	2,00	1,00
<b>TOTAL</b>		<b>307</b>	<b>686</b>	<b>376</b>	<b>157</b>	<b>1526</b>	<b>381,5</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							
	Corkscrew Anemone							
	Giant Anemone	3		5	3	11	3,67	1,15
TUBE WORMS	Knobby Anemone	11	8	6	3	28	7,00	3,37
	Christmas tree Worm	76	38	65	54	233	58,25	16,21
	Ghost Feather Duster		1		1	2	1,00	
	Magnificent Feather Duster			1		1	1,00	
	Social Feather Duster							
	Split Crown Feather Duster	2		7	6	15	5,00	2,65
	Star Horseshoe Worm							
	Variagated Feather Duster		1	1	5	7	2,33	2,31
CRUSTACEANS	Banded Coral Shrimp			1		1	1,00	
	Pederson Cleaner Shrimp	5	4	2	2	13	3,25	1,50
	Red Snapping Cleaner Shrimp	2		3		5	2,50	0,71
MOLLUSKS	Amber Penshell			2		2	2,00	
<b>TOTAL</b>		<b>99</b>	<b>52</b>	<b>93</b>	<b>74</b>	<b>318</b>	<b>79,5</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 : January 20, 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	3	Leaf coral (lettuce)	NE	T	4	4	4,5	N	Y	On 1 tip	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	1 left	13	--	Fire coral on branches			Hanging down
			Sea Rod, purple	SE	H	GONE						
			Staghorn coral	W	T	> 150	53	90	N	Y	N	Postion SWT.
10 R	2 LP	2	Sea Rod, black	S	M	2	23	6	N	N	N	New coral growth on this ball
			Star Coral, smooth	SW	H	--	4	6,5	Y	N	N	Fire coral on this ball
10R	3 P	3	Maze coral	NW	L	GONE						New coral growth on this ball
			Sea Rod, purple	W	T	6 alive	13	10	Y	Y	Y	Dying?
			Staghorn coral	NE	T	BROKEN OFF, IN OYSTER 5 NOW						Fire coral on this ball
			Star coral	NE	H	--	6,5	8,5	Y	N	N	
10 R	4 O	1	Finger coral	W	L	GONE						New coral growth on this ball.
			Staghorn coral		T	39	27	37	N	N	N	Lumpy Overgrowing Sponge on this ball
10R	5 O	1	Sea Rod, purple	NE	H	GONE						No 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	30	24	36	N	Y	Y	
10R	6 LP	1	Sea Rod, purple	NE	M	GONE						No 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	64	30,5	55	N	Y	N	
10R	7 O	0	No Plugs on this bal									New growth on this ball.
10R	8 P	4	Leaf coral (lettuce)	NE	H	GONE						New coral growth on this ball
			Sea Rod, black	SE	H	GONE						
			Sea Rod, black	SE	M	10	20	13	N	N	N	Marine putty to replug
			Sea Rod, black	S	M	6	23	14	Y	Y	N	Fire coral on this ball
			Sea Rod, white	E	H	118	23	35	Y	Y	N	
			Staghorn coral	S	T	GONE						
			Staghorn coral	SW	T	86	39	42	N	Y	N	1 Part with 13 branches broken off
			Staghorn coral	W	T	GONE IN LO PRO 6, GROWING THERE.						
<b>Subtotal</b>			<b>15 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	12	6	10	N	Y	N	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	1	Finger coral	NE	M	7 tips alive	6	10	N	Y	Y	ALGAE ON THIS BALL.
10 R	11 LP	1	Staghorn	N	H	> 100	40	65	N	Y	Y	New coral growth on this ball
10 R	12 LP	1	Brain coral	NW	T	--	7	10	N	Y	1 TIP	No new coral growth on this ball. ALGAE,
			Flower coral	NE	H	GONE						
			Flower coral	SE	L	GONE						
			Mustard hill coral	S	T	GONE						
10 R	13 B	4	Leaf coral ( Lettuce)	N	M	4	2	6	Y	Y	1 TIP	New coral growth on this ball
			Sea Rod, Black	NW	H	8	18	14	N	Y	N	Fire coral on this ball
			Sea Rod, Black	NW	M	10	18	20	N	Y	N	
			Staghorn	SW	H	> 150	40	75	N	Y	N	
10 R	14 U	10	Brain coral	N	L	--	5	5,5	N	N	N	New coral growth on this ball
			Finger coral	N	M	69	9,5	15	N	Y	ON 5 TIPS	Fire coral on this ball
			Leaf coral ( Lettuce)	E	M	5	4	6,5	Y	N	N	
			Leaf coral ( Lettuce)	NW	L	4	4	5,5	Y	Y	N	
			Leaf coral ( Lettuce)	NE	M	5	3,5	5	Y	N	N	
			Leaf coral ( Lettuce)	SE	M	5	3,5	4	N	N	Y	12o'clock
			Leaf coral ( Lettuce)	SE	ML	NOT FOUND						Dying? Position SEML in stead of SSEML
			Leaf coral ( Lettuce)	SSE	ML	1	4	6	Y	Y	N	8 o'clock
			Leaf coral ( Lettuce)	SSE	L	3	3,5	5	Y	N	N	5 o'clock
			Leaf coral ( Lettuce)	SE	M	NOT FOUND						
			Leaf coral ( Lettuce)	SW	ML	2	2,5	2,5	N	N	N	
			Leaf coral ( Lettuce)	SW	M	NOT FOUND						
			Pencil coral	NE	M	GONE						
			Staghorn	S	H	> 120	33	55	N	N	N	
			Staghorn	N	H	GONE						ALGAE ON THIS BALL, Macro Turf Algae.
10R	15 LP	2	Brain coral	SW	T	--	5	8	N	Y	N	New coral growth on this ball
			Brain coral	SE	H	--	3	5	N	Y	Y	ALGAE ON THIS BALL, Macro Turf Algae.
10R	16 B	2	Brain coral	NW	H	--	2	7	Y	Y	N	New coral growth on this ball
			Flower coral	NE	M	1 cup	1	1,5	N	Y	N	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>22 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	14	11	N	Y	N	
			Sea rod, white	NW	M	25	14	11	N	Y	N	
			Finger coral	SW	H	GONE						
10R	24 P	1	Brain coral	NW	T	GONE						New coral growth on this ball Marine putty replugged Fire coral on this ball
			Maze coral	SE	M	--	2,5	6	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						
10R	25 B	1	Pencil coral	NW	M	8	1	4	N	T	1 TIP	Previously identified as Mustard hill New coral growth.Fire coral on this ball
10R	26 LP	1	Maze coral	W	T	--	6	9	N	Y	N	No new coral growth on this ball.
10R	27 B	1	Sea Rod, black	SW	T	GONE						New coral growth on this ball Fire coral on this ball
			Sea Rod, white	W	T	52	21	14	Y	Y	N	
10R	28 P	2	Finger coral	SW	H	GONE						New coral growth on this ball Partially dead Fire coral on this ball
			Finger coral	NE	M	3	3,5	5	N	N	N	
			Flower coral	SE	H	GONE						
			Leaf coral (lettuce)	SW	M	6	4,5	6,5	Y	N	N	
			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>8</b>										
<b>Total</b>		<b>45 Number of live coral plugs</b>										

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

Date : January 19, 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	4	9	12	N	N	N	New coral growth on this ball.
				Pencil coral	NE	T	9	4,5	5,5	N	N	Y	Fire coral on this ball
				Pencil coral	N	H	6	2	4,5	N	Y	Y	
				Solitary Disk coral	N	L	DEAD						
				Staghorn coral	N	T	32	21	40	Y	N	N	
				Staghorn coral	S	T	75	35	57	Y	N	N	
				Staghorn coral	SW	T	63	32	53	Y	N	N	
				Staghorn coral	NW	H	GONE						
				Staghorn coral	SE	H	14	33	21	Y	N	N	17 Branches broken off, dropped
12L	2P		4	Pencil coral	NE	T	5	3	5,5	N	Y	Y	New coral growth on this ball
				Pencil coral	SW	T	DEAD						Fire coral on this ball
				Pencil coral	SE	H	13	3	4,5	Y	N	Y	
				Staghorn coral	NE	T	GONE						
				Staghorn coral	W	T	22	23	28	Y	Y	N	Position WT iso SET
				Staghorn coral	NW	T	85	32	51	N	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	76	32,5	63	Y	N	N	Fire coral on this ball
				Staghorn coral	NE	H	79	39	62	Y	N	N	
12L	4B		2	Staghorn coral	NE	H	GONE						New coral growth on this ball.
				Staghorn coral	SW	T	76	37	53	Y	N	N	Fire coral on this ball
				Staghorn coral	NW	H	> 100	46	80	N	Y	N	
12L	5P		6	Finger coral	NE	T	2 spots	1	1	N	Y	Y	Dying? Algae
				Finger coral	NW	L	1 spot	1	2	N	Y	Y	Dying? Algae
				Staghorn coral	SE	T	GONE						New coral growth on this ball.
				Staghorn coral	SW	T	GONE		IN	OYSTER	NOW		Fire coral on this ball
				Staghorn coral	NW	T	94	36	60	Y	N	N	
				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	74	29	51	N	N	N	
<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 19, 2004  
Observer: Marjo van den Bulck

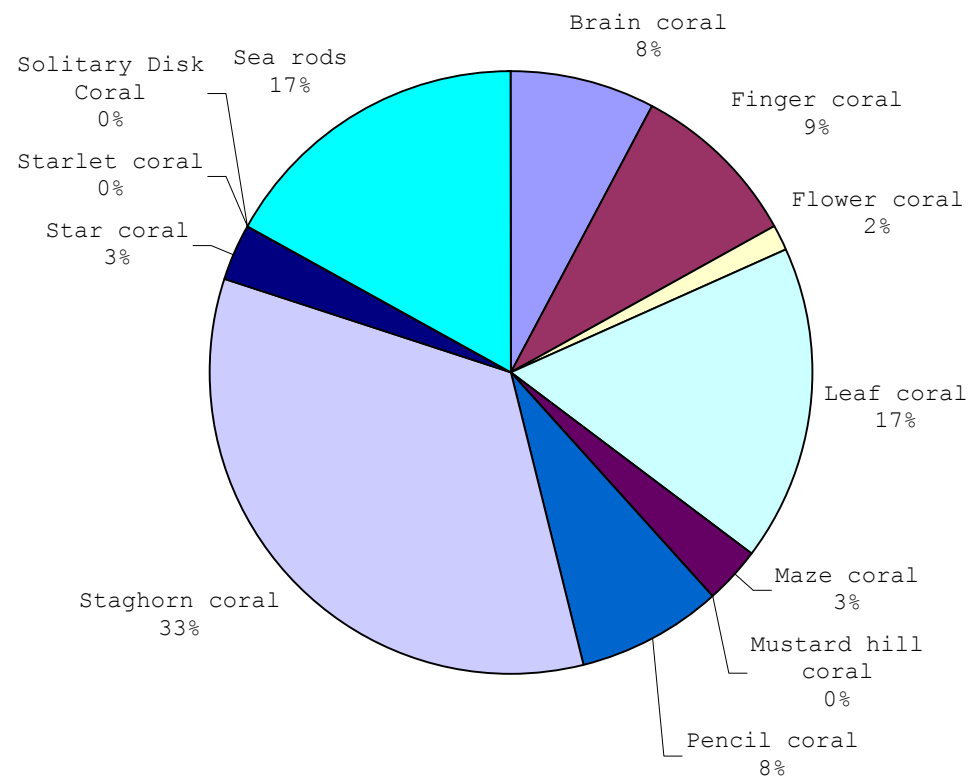
CN	B N/T	LP	Coral Species	Plug Orientation		Number of Branches/ Cups	Height cm	Width cm	Coral Growth on Plug Base Y/N	Algae at Base Y/N	Algae at Top Y/N	Remarks
				direction	height							
18L	1LP	2	Sea Rod, black	N	T	9	22	22	Y	N	N	New coral growth on this ball.
			Pencil coral	SE	M	9	4,5	5	N	N	1 TIP	
18L	2B	2	Flower coral	W	T	15	4	7	N	N	N	New coral growth on this ball. Lumpy Overgrowing Sponge
			Finger coral	SE	M	5	3,5	7	N	Y	N	
18L	3B	3	Sea Rod, black	SW	T	7	11	8	Y	N	N	New coral growth on this ball. Lumpy Overgrowing Sponge
			Leaf coral ( Lettuce)	W	H	1	1	2,5	N	Y	Y	
			Pencil coral	NE	H	2	2	3	N	Y	Y	
18L	4LP	2	Sea Rod, black	NE	T	8	14	15	Y	N	N	New coral growth on this ball. Sergeant Major Eggs
			Pencil coral	SE	M	7	2	4	Y	N	N	
18L	5B	3	Star coral	SE	T	-	2,5	4,5	Y	N	Y	New coral growth on this ball. Sergeant Major Eggs
			Sea Rod, white	SW	H	127	27	28	Y	N	N	
			Leaf Coral ( Lettuce)	NW	H	3	3	4	Y	N	Y	
18L	6P	2	Leaf coral ( Lettuce)	E	T	2	1,5	4	Y	N	N	New coral growth on this ball. Lumpy Overgrowing Sponge
			Star coral	SW	T	-	4	3,5	Y	N	N	
18L	7P	2	Maze coral	E	T	-	6	9,5	N	N	N	New coral growth on this ball.
			Star coral	W	T	-	3,5	6	Y	N	N	
			Finger coral	NW	T	DEAD						
18L	8LP	0										
18L	9B	1	Star coral	NE	H	-	1	6	Y	N	N	New coral growth on this ball. Sergeant
18L	10B	1	Finger coral	N	T	DEAD						New coral growth on this ball. Sergeant Major Eggs
			Pencil coral	E	H	5	3	5	Y	N	Y	
			Leaf coral ( Lettuce)	SW	H	DEAD						
18L	11LP	0										
18L	120	0										
<b>Total</b>			<b>18 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 2004**  
CLUSTER 10 WEST/RIGHT, CLUSTER 12 EAST/LEFT

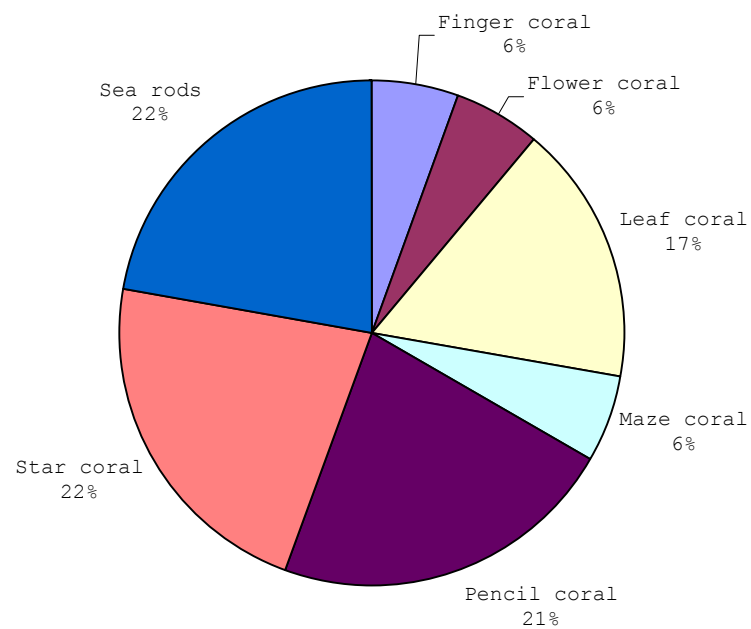
Coral Species	Number of Live Plugs		% of Total
Brain coral	5		7,69
Finger coral	6		9,23
Flower coral	1		1,54
Leaf coral	11		16,92
Maze coral	2		3,08
Mustard hill coral	0		0,00
Pencil coral	5		7,69
Staghorn coral	22		33,85
Star coral	2		3,08
Starlet coral	0		0,00
Solitary Disk Coral	0		0,00
Sea rods	11		16,92
black	6		
purple	1		
white	4		
<b>TOTAL</b>	<b>65</b>		<b>100</b>



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

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

<b>Coral Species</b>	<b>Number of Live Plugs</b>		<b>% of Total</b>
Finger coral		1	5,56
Flower coral		1	5,56
Leaf coral		3	16,67
Maze coral		1	5,56
Pencil coral		4	22,22
Star coral		4	22,22
Sea rods		4	22,22
	black	3	
	white	1	
<b>TOTAL</b>		<b>18</b>	<b>100</b>

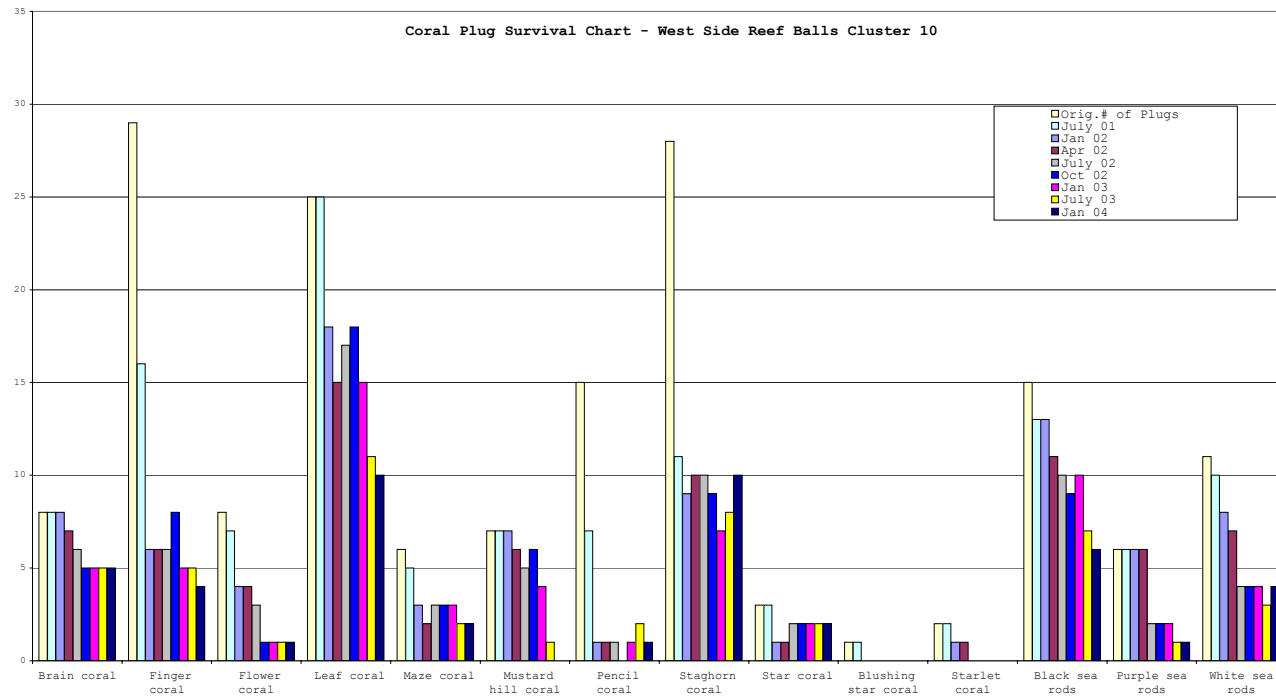


PORTOMAREA MARINE MONITORING

Coral Plug Survival Summary  
West Side Reef Balls, Cluster 10

July 2001 Monitoring (per M.Kuenen)				January 2002 Monitoring		April 2002 Monitoring		July 2002 Monitoring		October 2002 Monitoring		January 2003 Monitoring		July 2003 Monitoring		January 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
Brain coral*	8	8	0%	8	0%	7	13%	6	25%	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%
Flower coral	8	7	13%	4	50%	4	50%	3	63%	1	88%	1	88%	1	88%	1	88%
Leaf coral	25	25	0%	18	28%	15	40%	17	32%	18	28%	15	40%	11	56%	10	60%
Maze coral	6	5	17%	3	50%	2	67%	3	50%	3	50%	3	50%	2	67%	2	67%
Mustard hill coral*	7	7	0%	7	0%	6	14%	5	29%	6	14%	4	43%	1	86%	0	100%
Pencil coral	15	7	53%	1	93%	1	93%	1	93%	0	100%	1	93%	2	87%	1	93%
Staghorn coral	28	11	61%	9	68%	10	64%	10	64%	9	68%	7	75%	8	71%	10	64%
Star coral	3	3	0%	1	67%	1	67%	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%
Starlet coral	2	2	0%	1	50%	1	50%	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%
Sea rods purple	6	6	0%	6	0%	6	0%	2	67%	2	67%	2	67%	1	83%	1	83%
Sea rods white	11	10	9%	8	27%	7	36%	4	64%	4	64%	4	64%	3	73%	4	64%
			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>

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

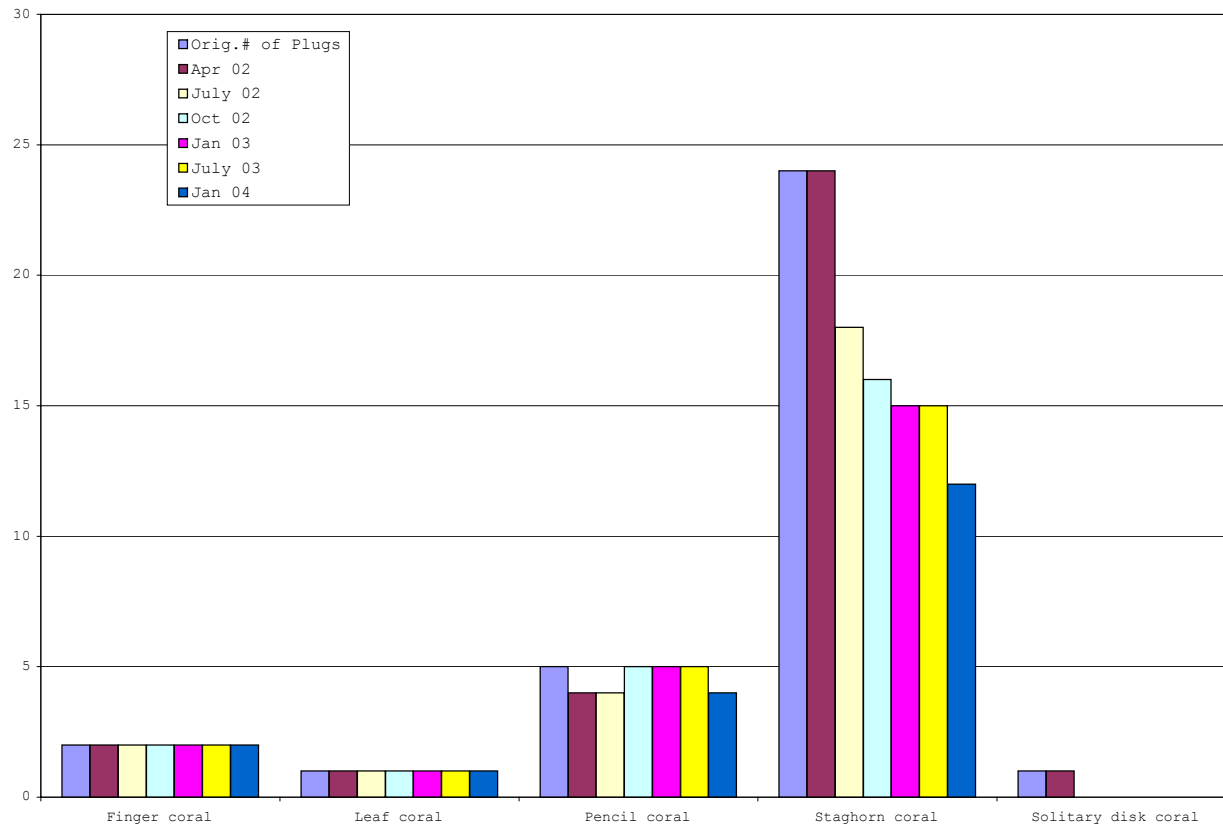


Coral plug mortality chart 1

PORTOMAREA MARINE MONITORING

Coral Species	Orig.# of Plugs	April 2002 Monitoring		July 2002 Monitoring		October 2002 Monitoring		January 2003 Monitoring		July 2003 Monitoring		January 2004 Monitoring	
		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	Number of Live Plugs	Mortality 21.5 months
Finger coral	2	2	0%	2	0%	2	0%	2	0%	2	0%	2	0%
Leaf coral	1	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%
Pencil coral	5	4	20%	4	20%	5	0%	5	0%	5	0%	4	20%
Staghorn coral	24	24	0%	18	25%	16	33%	15	38%	15	38%	12	50%
Solitary disk coral	1	1	0%	0	100%	0	100%	0	100%	0	100%	0	100%
<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>	<b>19</b>	<b>42%</b>

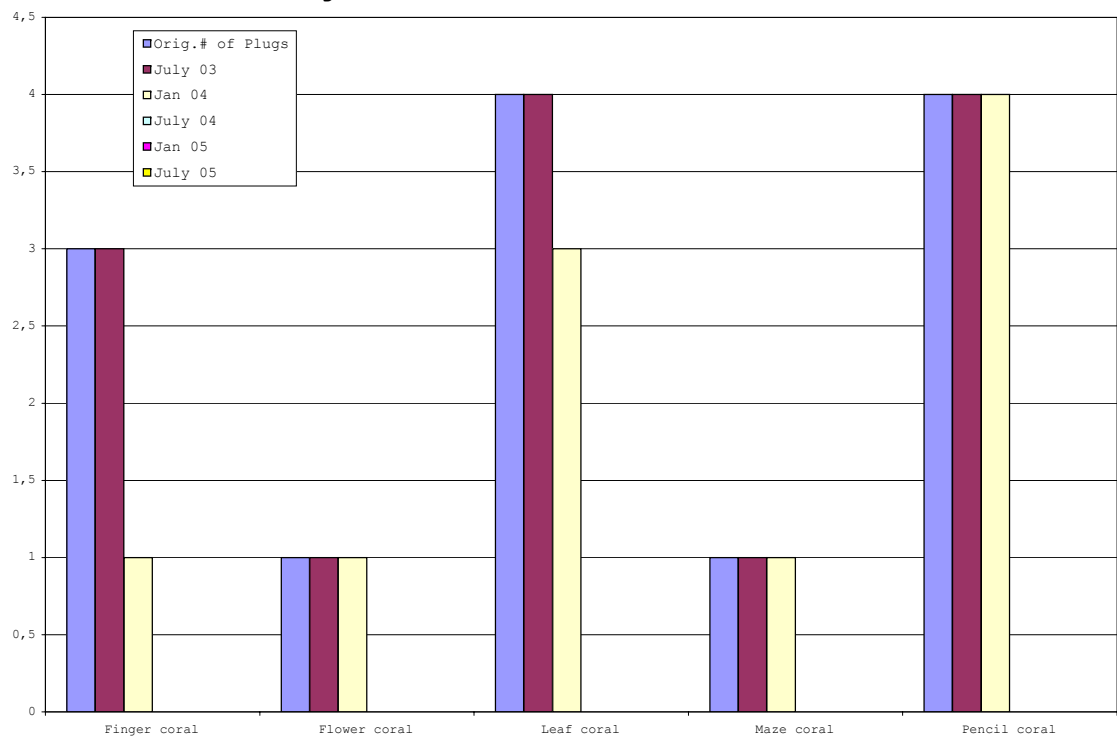
Coral Plug Survival Chart East Side Reef Balls Cluster 12



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%						
Flower coral	1	1	0%	1	0%						
Leaf coral	4	4	0%	3	25%						
Maze coral	1	1	0%	1	0%						
Pencil coral	4	4	0%	4	0%						
Star coral	4	4	0%	4	0%						
Sea rod black	3	3	0%	3	0%						
Sea rod white	1	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>						

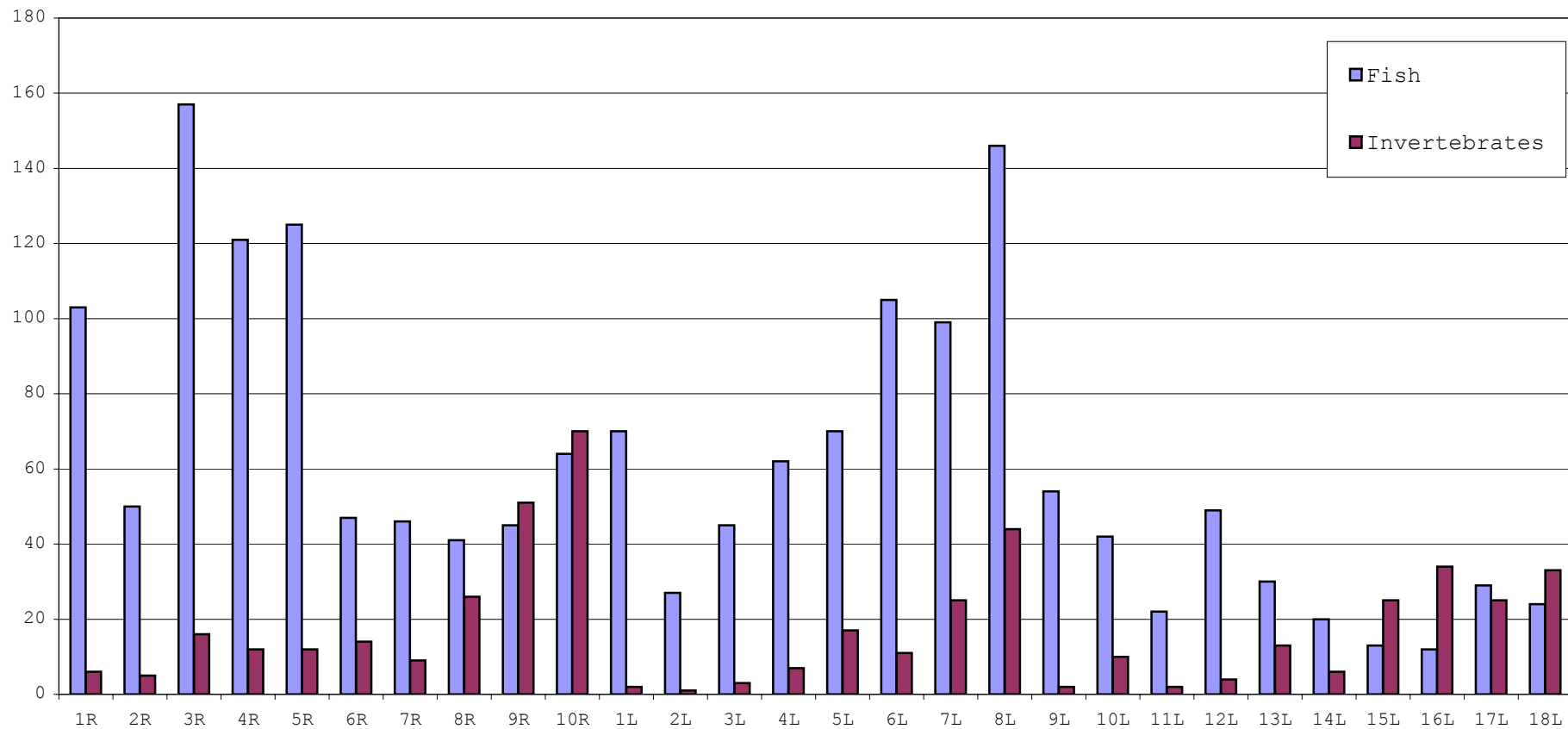
Coral Plug Survival Chart East Side Reef Balls Cluster 18



**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	103	6,00	6	1,03
2R	50	2,91	5	1,03
3R	157	9,14	16	3,30
4R	121	7,04	12	2,47
5R	125	7,28	12	2,47
6R	47	2,74	14	2,89
7R	46	2,68	9	1,86
8R	41	2,39	26	5,36
9R	45	2,62	51	10,52
10R	64	3,73	70	14,43
1L	70	4,07	2	0,41
2L	27	1,57	1	0,21
3L	45	2,62	3	0,62
4L	62	3,61	7	1,44
5L	70	4,07	17	3,51
6L	105	6,11	11	2,27
7L	99	5,76	25	5,15
8L	146	8,50	44	9,07
9L	54	3,14	2	0,41
10L	42	2,44	10	2,06
11L	22	1,28	2	0,41
12L	49	2,85	4	0,82
13L	30	1,75	13	2,68
14L	20	1,16	6	1,24
15L	13	0,76	25	5,15
16L	12	0,70	34	7,01
17L	29	1,69	25	5,15
18L	24	1,40	33	6,80
<b>TOTAL</b>	<b>1718</b>	<b>100</b>	<b>485</b>	<b>99,79</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 8, 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.
FISH												Total	Mean	St.Dev.	
ANGELFISH	French Angelfish			1							1		2	1,00	
BASSLET	Fairy Basslet														
BLENNY	Redlip Blenny	1		3	1		2						7	1,75	0,96
	Spinyhead Blenny								1	1	2		4	1,33	0,58
BOXFISH	Smooth Trunkfish					1							1	1,00	
BUTTERFLYFISH	Banded Butterflyfish				2								2	2,00	
	Four-eye Butterflyfish										2		2	2,00	
CARDINALFISH	Belted Cardinalfish			1									1	1,00	
CHROMIS	Blue Chromis														
	Brown Chromis	12		48		30	4	8					102	20,40	18,35
DAMSELFISH	Beaugregory	1											1	1,00	
	Bicolor Damselfish			36	12	4	3				2	1	58	9,67	13,49
	Cocoa Damselfish	2	1	3		6	4	1	3	1	2		23	2,56	1,67
	Dusky Damselfish	1	1			2	2	3			2	7	18	2,57	2,07
	Sergeant Major	21	7		8	5	11	2	3	2	8		67	7,44	5,94
	Threespot Damselfish														
	Yellowtail Damselfish			1	4	3	3	1					12	2,40	1,34
DRUM	Spotted Drum											1	1	1,00	
EEL	Spotted Moray			1									1	1,00	
FLOUNDER	Peacock Flounder				2	2							4	2,00	
GOATFISH	Spotted Goatfish	1			1								2	1,00	
	Yellow Goatfish	4					2		6				12	4,00	2,00
GOBY	Bridled Goby	10	6			10	5	16	15	22	13		97	12,13	5,59
	Neon Goby														
GROUPER	Coney	1						5	1	1	1		9	1,80	1,79
	Graysby														
	Rock Hind														
GRUNT	Bluestriped Grunt											1	1	1,00	
	French Grunt	1	1	13		1		2				1	19	3,17	4,83
	Smallmouth Grunt						1						1	1,00	
HAMLET	Butter Hamlet										1	1	1,00		
HOGFISH	Spanish Hogfish								1				1	1,00	
JACK	Bar Jack														
	Palometa		1										1	1,00	
PARROTFISH	Blue Parrotfish														
	Princess Parrotfish				1	1	2	1				2	7	1,40	0,55
	Queen Parrotfish			1		5	1		1	2	2		12	2,00	1,55
	Redband Parrotfish	1		1	2	1	1				1		7	1,17	0,41
	Stoplight Parrotfish								1	1	3		5	1,67	1,15
	Striped Parrotfish														
PUFFER	Sharpnose Puffer														
SCORPIONFISH	Spotted Scorpionfish	1		2	1								4	1,33	0,58
SEABASS	Harlequin Bass														
SNAPPER	Gray Snapper														
	Red Snapper					1							1	1,00	
SQUIRRELFISH	Blackbar Soldierfish			1			5	1			11		18	4,50	4,73
	Squirrelfish		1	3			1	1			2		8	1,60	0,89
SURGEONFISH	Blue Tang				4					1			5	2,50	2,12
	Doctorfish														
	Ocean Surgeonfish	1	3										4	2,00	1,41
WRASSE	Bluehead Wrasse	16	20	31	75	50		3	4	6			205	25,63	25,49
	Clown Wrasse			1	3								4	2,00	1,41
	Puddingwife		1		1	2			1				5	1,25	0,50
	Rainbow Wrasse														
	Slippery Dick	26	8	8	4				1				47	9,40	9,74
	Yellowhead Wrasse										3	2	5	2,50	0,71
OTHERS	Lizardfish, Bluestriped														
	Mojarra, Yellowfin	3											3	3,00	
	Soapfish, Greater					1		1	1				3	1,20	
	Trumpetfish			2				1	1	1	1		6	1,20	0,45
<b>TOTAL</b>		<b>103</b>	<b>50</b>	<b>157</b>	<b>121</b>	<b>125</b>	<b>47</b>	<b>46</b>	<b>41</b>	<b>45</b>	<b>64</b>		<b>799</b>	<b>79,9</b>	
INVERTEBRATES												Total	Mean	St.Dev.	
ANEMONE	Corkscrew Anemone					1		2	3	1			7	1,75	0,96
	Knobby Anemone	2		1	1		1		3	6	6		20	2,86	2,27
	Giant Anemone				2	2	6	1				5	16	3,20	2,17
ENCHINODERMS	Pencil Urchin			1									1	1,00	
	Longspined Sea Urchin				2						1			1,50	0,71
CRUSTACEANS	Pederson Cleaner Shrimp								4	1	1		6	2,00	1,73
	Nimble Spray Crab														
	Yellowline Arrow Crab														
TUBE WORMS	Christmas Tree Worm	2	2	9	1	4	2	2	11	29	25		87	8,70	10,24
	Magnificent Feather Duster			1									1	1,00	
	Social Feather Duster						1						1	1,00	
	Split Crown Feather D.														
	Star Horseshoe Worm								1	6	7		14	4,67	3,21
	Variegated Feather Duster				2	2	3			3	12		22	4,40	4,28
MOLLUSKS	Amber Penshell			1	1								2	1,00	
	Atlantic Pearl Oyster											3	3	3,00	
	File Clam														
SPONGES	Lumpy Overgrowing Sponge	2	3	3	3	3	1	4	4	4	11		38	3,80	2,70
<b>TOTAL</b>		<b>6</b>	<b>5</b>	<b>16</b>	<b>12</b>	<b>12</b>	<b>14</b>	<b>9</b>	<b>26</b>	<b>51</b>	<b>70</b>		<b>221</b>	<b>22,1</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 9, 2004

TIME: 08:40 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		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			
FISH																				Total	Mean	Dev.
ANGELFISH	French Angelfish													1						1	1,00	
BLENNY	Redlip Blenny				1	1		2												4	1,33	0,58
	Saddled Blenny	1				1		1												3	1,00	
	Spiny Head Blenny																1	1	1	3	1,00	
BOXFISH	Smooth Trunkfish				1		1													2	1,00	
	Spotted Trunkfish									1	1				1					3	1,00	
BUTTERFLYFISH	Banded Butterflyfish						2									2				4	2,00	
	Foureye Butterflyfish									2	2	1	2	1						8	1,60	0,55
CARDINALFISH	Belted Cardinalfish																					
CHROMIS	Brown Chromis	18				14	75	60	9	4	2									182	26,00	29,19
DAMSELFISH	Beaugregory Damselfish	6	5	1	1	1						1								15	2,50	2,35
	Bicolor Damselfish	1	3		11	1	3	7	1	1	7	3	3		1	1				43	3,31	3,15
	Cocoa Damselfish	1	3	3	8	8	5	5	1	1	1	2								38	3,45	2,70
	Dusky Damselfish	1				3	2			3	3									12	2,40	0,89
	Sergeant Major	2		3		3	6	2	7	5	1	2	2	2		2	5	1		43	3,07	1,90
	Threespot Damselfish	1																		1	1,00	
Yellowtail Damselfish				1				1		1	1					1			5	1,00		
EEL	Spotted Moray			1	1															2	1,00	
FILEFISH	Slender Filefish																					
	Orange Spotted Filefish												1							1	1,00	
FLOUNDER	Peacock Flounder																					
GOATFISH	Spotted Goatfish								1											1	1,00	
	Yellow Goatfish			1	5								4	3					2	15	3,00	1,58
GOBY	Bridled Goby	4		6		12	2	3	1	5	15	3	30	12	11		7	15	13	139	9,27	7,51
	Neon Goby																					
GROUPE	Coney			1	2		1	1			1		1		1					8	1,14	0,38
	Graysby																					
	Red Hind			1																1	1,00	
GRUNT	Bluestriped Grunt				1		1				1	1	1	1		2				8	1,14	0,38
	French Grunt	1	1	1	7	1	4		120	2		1			1	1	1	1		142	10,92	32,82
	Juvenile Grunt U.I.																					
HAMLET	Butter Hamlet																					
HOGFISH	Spanish Hogfish																					
JACK	Bar Jack			1	1									1						3	1,00	
PARROTFISH	Princess Parrotfish		2	4	1				2				1	3			1	5	4	23	2,56	1,51
	Queen Parrotfish	1		2	1		1		2		1		1							9	1,29	0,49
	Redband Parrotfish																		1	1	1,00	
	Redtail Parrotfish																					
	Stoplight Parrotfish										1	1		1	1				1	5	1,00	
Striped Parrotfish																						
PUFFER	Sharpnose Puffer												1							1	1,00	
SCORPIONFISH	Spotted Scorpionfish	1																		1	1,00	
SEABASS	Harlequin Bass																					
SNAPPER	Gray Snapper				2	2							2			5				11	2,75	1,50
	Red Snapper	1												1	1					3	1,00	
SQUIRELFISH	Squirrelfish			1	1	2	1	1												6	1,20	0,45
SURGEONFISH	Blue Tang		2		6															8	4,00	2,83
	Doctorfish																		1	1	1,00	
	Ocean Surgeonfish	3	1	1				3		2	2	1		1	1			1		16	1,60	0,84
WRASSE	Bluehead Wrasse	16	3	9	8	19	3	9	3	18	1	2								91	8,27	6,68
	Clown Wrasse	3	1	1			2													7	1,75	0,96
	Puddingwife	2		3	1	1	2			2									1	12	1,71	0,76
	Slippery Dick	5	5	4	2					3		2								21	3,50	1,38
	Yellowhead Wrasse														1	1				2	1,00	
OTHERS	Mojarra, Yellowfin	1		1								1								3	1,00	
	Sand Diver																1			1	1,00	
	Soapfish, Greater					1				1		1		1						4	1,00	
	Trumpetfish	1	1							1		1	2							6	1,20	0,45
<b>TOTAL</b>		<b>70</b>	<b>27</b>	<b>45</b>	<b>62</b>	<b>70</b>	<b>105</b>	<b>99</b>	<b>146</b>	<b>54</b>	<b>42</b>	<b>22</b>	<b>49</b>	<b>30</b>	<b>20</b>	<b>13</b>	<b>12</b>	<b>29</b>	<b>24</b>	<b>919</b>	<b>51,06</b>	
<b>INVERTEBRATES</b>																				<b>Total</b>	<b>Mean</b>	<b>St. Dev.</b>
ANEMONE	Corkscrew Anemone					1					7			1	1				2	12	2,4	2,61
	Giant Anemone					4	1	3	1	1	1		1	4	2	2				20	2,0	1,25
	Knobby Anemone	1	1		1	3	2	1	3		2	1	2							17	1,7	0,82
CRUSTACEANS	Banded Coral Shrimp								1												1,0	
	Nimble Spray Crab	1			6		6	20	10	1										44	7,3	7,09
	Pederson Cleaner Shrimp																					
	Yellowline Arrow Crab					3							1							4	2,0	1,41
SEGM. WORMS	Bearded Fireworm			1																1	1,0	
	Christmas Tree Worm			1		4	2	1	27					3		20	31	25	28	142	14,2	12,97
	Ghost Feather Duster																					
	Star Horse Shoe Worm																					
Variegated Fth.Dstr.															1				1	1,0		
MOLLUSKS	Amber Penshell																					
	Atlantic Thorny Oyster					1			1					1						3	1,0	
	Spiny File Clam																					
SPONGES	Lumpy Overgrowing Sponge			1					1		1		4	2	3	3			3	18	2,3	1,16
ECHINODERMS	Blunt-spined Brittle Star					1														1	1,0	
	Longspined Sea Urchin		1	2	12	6	11	18	17	1								1	1	70	7,0	6,93
<b>TOTAL</b>		<b>2</b>	<b>1</b>	<b>3</b>	<b>7</b>	<b>17</b>	<b>11</b>	<b>25</b>	<b>44</b>	<b>2</b>	<b>10</b>	<b>2</b>	<b>4</b>	<b>13</b>	<b>6</b>	<b>25</b>	<b>34</b>	<b>25</b>	<b>33</b>	<b>264</b>	<b>14,67</b>	

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