# PORTOMAREA MARINE MONITORING

## CORAL AND FISH/INVERTEBRATE SURVEY

## January 2002

# PORTOMAREA MARINE MONITORING

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# PORTOMAREA MARINE MONITORING

## FISH/INVERTEBRATE AND CORAL SURVEY OVERVIEW

Survey dates: January 7-23, 2002
Data observed and recorded by: Marjo van den Bulck and Maryke Kolenousky

We would like to express our thanks to Paul C. Hoetjes, Department of Environment and Nature Conservation, Curaçao, N.A., for his support and assistance in verifying the validity of the transect setups, as well as his expertise in identifying algae species and interpreting coral health/diseases.

### WATER TEMPERATURE & VISIBILITY

During the monitoring period, there was a high incidence of rainfall, occurring as daily showers.

Water temperature was 28.6C on January 8/02, declining to 27.6C on January 23/02.

Visibility varied from 30m on Transect #1 (12m depth) to 15m at Transect #2 (6m depth).

At the reef ball clusters on the west side of the bay (1.2-3.8m depth), visibility was 7.5m. The lowest visibility of 2.5m was recorded near the reef ball clusters on the east side of the bay (1.5-4.3m depth).

### TRANSECTS

Three (3) transect lines 100m 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.

**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 1 had a high Y Algae count, observed mainly on the old dead boulders. Transect 2 is basically a shallow patch reef, and the high percentage of sand cover reflects the spaces between coral patches.

Transect 3 at a depth of 10m, is on the east side of the bay on the slope of the first inner reef, and would be expected to be similar to Transect 1. However, the percentage of sand bottom cover in Transect 3 is significantly higher (56% vs. 45%), particularly in the 50-70m and 75-95m sections, and the hard coral cover is lower (18% vs. 25%). A high percentage (65%) of partially dead and stressed corals were observed along the 0-20m section of Transect 3. Many coral heads exhibited 'sliming', an attempt to throw off sand and debris. There was new coral growth in the form of brain and mustard hill corals on old 'rock' observed along Transect #3. The new growth also had sand accumulated on the tops.

One confirmed case of 'Black-Band disease' was observed on a brain coral near Transect 2.

Damage

There is significant damage from fishing lines. Many meters of fishing line were wound about and snagged in the corals, particularly along Transect 1. Signs of recent damage, e.g. broken hard and soft corals, were not recorded along the transect line, but were observed as an overall condition of the reef on both the west and east sides of the bay. Since there have been no recent storms, it is assumed that this damage is attributable to human impact.

**FISH/INVERTEBRATE SURVEY**

Approximately 35% less fish were recorded along Transect #3 (10m depth) on the east side of the bay as compared to Transect #1 (12m depth) on the west side.

Significantly fewer worms were observed along Transect 3.

Unusual fish: A total of six (6) juvenile blue parrotfish were observed along the three transects.

Many French grunts and Butterflyfish exhibited dark, circular spots on their skin. It is not clear if this is a disease or parasites.

## 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.

### CORAL PLUGS

Cluster 10R is the only cluster where coral plugs have been placed to date. Eighty-five (85) live coral plugs were recorded. Five (5) out of the thirty-one (31) balls in cluster 10R have new coral growth exclusive of the plugs. Some of the plugs with dead coral fragments on them were unidentifiable as to species, preventing calculation of mortality rates. Several plugs exhibited damage from external sources, e.g. parrotfish bite marks, broken tips of Staghorn corals on reef ball tops (snorkelers' fins?).

Prior survey data is conflicting and incomplete--there is no baseline data on several of the reef balls in cluster 10R. Any comparisons and mortality rates should therefore be considered only as approximations.

Note: Since completion of the survey, several plugs have been placed in clusters 11L and 12L (Feb.2/02), species and location on the balls should be recorded as a baseline for future surveys.

### FISH/INVERTEBRATE SURVEY - OBSERVATIONS

Many adult Coneys and Sergeant majors were observed on and near the reef balls on the west side of the bay. There was one confirmed observation of Sergeant major eggs deposited inside one of the balls. It is not known if the Coneys were spawning, however it is not usual for them to be found in such shallow water.

A high number of juvenile fish such as damsels, grunts, and wrasses were using the west side reef balls for shelter.

The east side clusters were recently placed (Dec.2001), and at the time of the monitoring period did not have rubble in them. There were significantly fewer juveniles utilizing the balls on the east side.

# PORTOMAREA MARINE MONITORING
## CORAL LINE TRANSECT SUMMARY

Date : January 2002
Observers: Marjo van den Bulck & Maryke Kolenousky

| Transect No. Depth | Hard Corals | | | | | | Soft | Coralline | Turf | Macro- | Abiotic | Tridiдem- | Sponges | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 12m | Total | Healthy | (Prt)Dead | Sick | Broken | Bleached | Corals | Algae | Algae | Algae | (Sand) | num | | |
| 0-20m | 9 | 4 | 4 | 0 | 0 | 1 | 1 | 0 | 13 | 0 | 16 | 0 | 1 | 40 |
| 25-45m | 15 | 5 | 6 | 2 | 0 | 2 | 0 | 0 | 12 | 0 | 13 | 0 | 0 | 40 |
| 50-70m | 12 | 5 | 7 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 21 | 0 | 2 | 40 |
| 75-95m | 4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 22 | 0 | 0 | 40 |
| Mean | 10 | 4 | 5 | 1 | 0 | 1 | 1 | 0 | 11 | 0 | 18 | 0 | 1 | 40 |
| % cover | 25 | 40 | 48 | 5 | 0 | 8 | 1 | 0 | 27 | 0 | 45 | 0 | 2 | 100 |
| standard deviation | 4,69 | 1,41 | 2,22 | 1,00 | 0,00 | 0,96 | 0,58 | 0,00 | 4,57 | 0,00 | 4,24 | 0,00 | 0,96 | 0,00 |

| Transect No. Depth | Hard Corals | | | | | | Soft | Coralline | Turf | Macro- | Abiotic | Tridiдem- | Sponges | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 6m | Total | Healthy | (Prt)Dead | Sick | Broken | Bleached | Corals | Algae | Algae | Algae | (Sand) | num | | |
| 0-20m | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 32 | 0 | 0 | 40 |
| 25-45m | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 23 | 0 | 0 | 40 |
| 50-70m | 13 | 7 | 5 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | 23 | 0 | 0 | 40 |
| 75-95m | 12 | 11 | 1 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 23 | 0 | 0 | 40 |
| Mean | 8 | 6 | 2 | 0 | 0 | 0 | 1 | 0 | 7 | 0 | 25 | 0 | 0 | 40 |
| % cover | 19 | 77 | 20 | 3 | 0 | 0 | 1 | 0 | 17 | 0 | 63 | 0 | 0 | 100 |
| standard deviation | 5,80 | 4,11 | 2,38 | 0,50 | 0,00 | 0,00 | 1,00 | 0,00 | 5,56 | 0,00 | 4,50 | 0,00 | 0,00 | 0,00 |

| Transect No. Depth | Hard Corals | | | | | | Soft | Coralline | Turf | Macro- | Abiotic | Tridiдem- | Sponges | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 10m | Total | Healthy | (Prt)Dead | Sick | Broken | Bleached | Corals | Algae | Algae | Algae | (Sand) | num | | |
| 0-20m | 17 | 6 | 11 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 18 | 0 | 0 | 40 |
| 25-45m | 2 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 32 | 0 | 0 | 40 |
| 50-70m | 5 | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 15 | 0 | 18 | 0 | 0 | 40 |
| 75-95m | 4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 22 | 0 | 0 | 40 |
| Mean | 7 | 3 | 4 | 0 | 0 | 0 | 2 | 0 | 9 | 0 | 23 | 0 | 0 | 40 |
| % cover | 18 | 43 | 57 | 0 | 0 | 0 | 4 | 0 | 22 | 0 | 56 | 0 | 0 | 100 |
| standard deviation | 6,78 | 2,16 | 4,69 | 0,00 | 0,00 | 0,00 | 1,26 | 0,00 | 6,70 | 0,00 | 6,61 | 0,00 | 0,00 | 0,00 |

# PORTOMAREA MARINE MONITORING

## CORAL LINE TRANSECT SUMMARY

Survey Date: January 2002

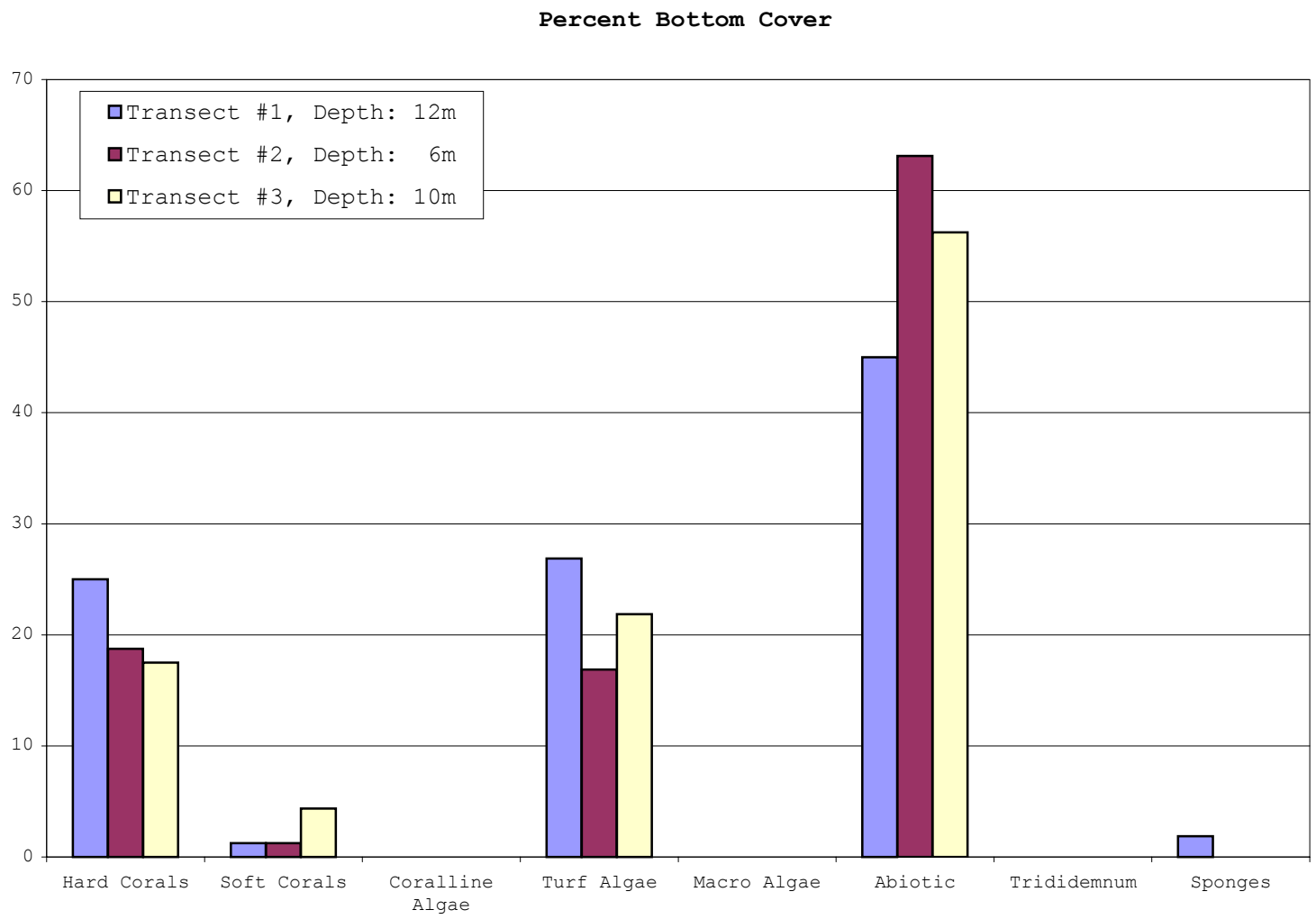


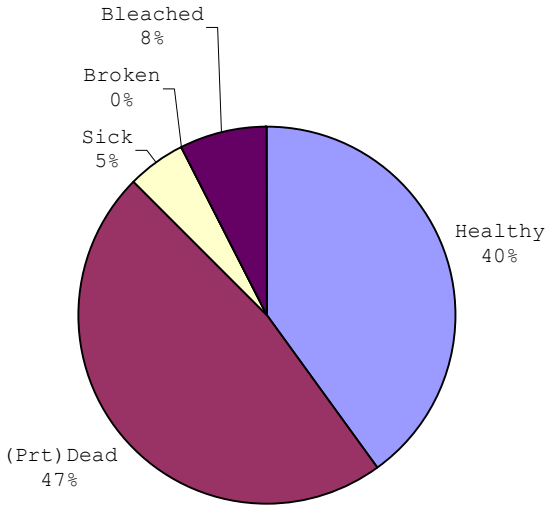

Chart % Bottom Cover
MAK

# PORTOMAREA MARINE MONITORING

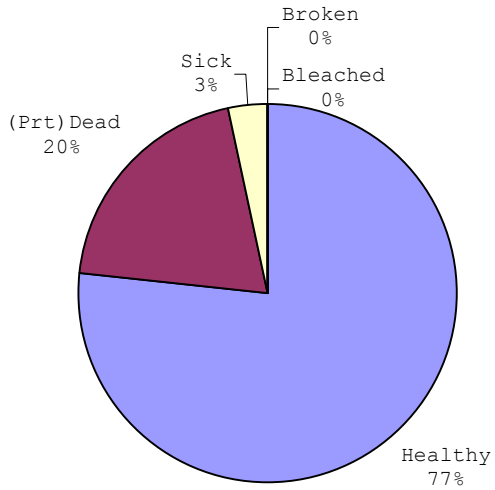
## CORAL LINE TRANSECT SUMMARY

Survey Date: January 2002

### Coral Health Transect 1, Depth 12m




### Coral Health Transect 2, Depth 6m




### Coral Health Transect 3, Depth 10m

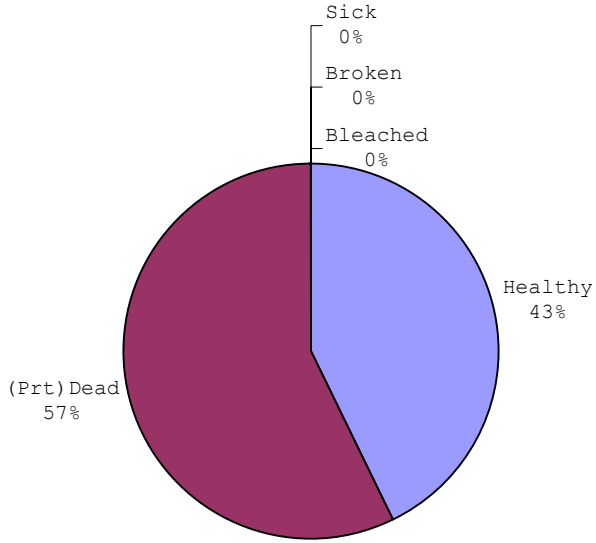



Chart 2 Coral Health
MAK

# PORTOMAREA MARINE MONITORING

Transect No: 1, Depth: 12m, Section 0-20m Visibility : 30m Observers: Maryke Kolenousky, Marjo van den Bulck
Date : 18/01/02 Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | |
| 0,5 | | | | | | | | | | | | | SD | |
| 1 | | | | | | | | | | | | | SD | |
| 1,5 | | | Smooth | | | | | | Healthy | | | | | |
| 2 | | | | | | | | | | | | | RC | |
| 2,5 | | | | | | | | | | | | | RC | |
| 3 | | | | | | | | | | Encrusting | | | | |
| 3,5 | | | | | | Lettuce | | | Dead, 50% | | | | | |
| 4 | | | | | | | | Flower | Healthy,small mustard near it | | | | | |
| 4,5 | | | | | | | | | Y Algae | | | TA | | |
| 5 | | | | | | | | | | | | TA | | |
| 5,5 | | | | | | | | | | | | | RC | |
| 6 | | | | | | | | | | | | | SD | |
| 6,5 | | | | | | | | | | | | | SD | |
| 7 | | | | | | | | | | | | | SD | |
| 7,5 | | | | | | | | | | | | | SD | |
| 8 | | | | | | | | | | | | TA | | |
| 8,5 | | | | | | | | | | | | TA | | |
| 9 | | | | | | | | | Y Algae | | | TA | | |
| 9,5 | | | | | | | | | | | | | RC | |
| 10 | | | Boulder | | | | | | Dead, 50%, dead lettuce | | | | | |
| 10,5 | | | | | | | | | Near encr. Gorg. | | | | RC | |
| 11 | | | | | | | | | | | | | RC | |
| 11,5 | | | | | | | | | Y Algae | | | TA | | |
| 12 | | | | | | | | | | | | | SD, RC | |
| 12,5 | | | | | | | | | Y Algae | | | TA | | |
| 13 | | | | | | Lettuce | | | Healthy on dead star | | | | | |
| 13,5 | | | | | | | | | Blue Green Algae | | | TA | | |
| 14 | | Mustard | | | | | | | Bleached 10%,Very small | | | | | |
| 14,5 | | | | | | | | | Encrusting on dead star | | BRO | | | |
| 15 | | | | | | | | | | | | | RC | |
| 15,5 | | | Smooth | | | | | | Dead, 50%. Y Algae | | | | | |
| 16 | | Mustard | | | | | | | Healthy near Lettuce coral | | | | | |
| 16,5 | | | | | | | | | Y Algae | | | TA | | |
| 17 | | | | | | | | | Y Algae | | | TA | | |
| 17,5 | | | | | | | | | Y Algae | | | TA | | |
| 18 | | | Smooth | | | | | | Dead, 95%. Y Algae | | | | | |
| 18,5 | | | | | | | | | | | | | RC | |
| 19 | | | | | | | | | Y Algae, Bleu Green Algae | | | TA | | |
| 19,5 | | | | | | | | | Y Algae, Bleu Green Algae | | | TA | | |
| 20 | | | | | | | | | | | | | SD | |
| | | | | | | | | | PD H S BL | | | | | |
| **Total** | **0** | **2** | **4** | **0** | **0** | **2** | **0** | **1** | 4 4 0 1 | **1** | **1** | **13** | **16** | |
| | **0** | **3** | **17** | **1** | **2** | **11** | **0** | **1** | **17 14 2 1** **0** | **1** | **2** | **44** | **78** | **GRAND TOTAL** |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

Coral transect #1

coral transect 1,0-20m

# Portomarea Marine Monitoring

Transect No: 1, 25-45m  Visibility : 30m  Observers: Maryke, Marjo
Date : 18/01/02  Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | Boulder | | | | | | Dead, 25% | | | | | | |
| 1 | | | | | | | | | | | | | RB | | |
| 1,5 | | | | | | | | | | | | | SD/RB | | |
| 2 | | | | | | | | | | | | | RC | | |
| 2,5 | | | | | | | | | | | | | SD | | |
| 3 | | | | | | | | | Y Algae | | | TA | | | |
| 3,5 | | | | | | | | | Y Algae | | | TA | | | |
| 4 | | | | | | | | | | | | | SD | | |
| 4,5 | | | | | | | | | | | | | RB | | |
| 5 | | | | | | | | | | | | | RB | | |
| 5,5 | | | | | | | | | Y Algae | | | TA | | | |
| 6 | | | | | | Lettuce | | | Dead, 60% | | | | | | |
| 6,5 | | | | | | | | | | | | | RC | | |
| 7 | | | | | | | | | | | | | RC | | |
| 7,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 8 | | | Boulder | | | | | | Bleached,10% | | | | | | |
| 8,5 | | | | | | | | | Y Algae | | | TA | | | |
| 9 | | | | | Finger | | | | Healthy | | | | | | |
| 9,5 | | | | | | | | | Y Algae | | | TA | | | |
| 10 | | Mustard | | | | | | | Healthy, small on dead star | | | | | | |
| 10,5 | | | | | | | | | Y Algae | | | TA | | | |
| 11 | | | | | | Lettuce | | | Healthy on dead star | | | | | | |
| 11,5 | | Mustard | | | | | | | Bleached, 10% | | | | | | |
| 12 | | | Boulder | | | | | | Dead, 40% | | | | | | |
| 12,5 | | | | | | | | Flower | Dead, 40% | | | | | | |
| 13 | | | | | | | | | | | | | SD | | |
| 13,5 | | | | | | | | | | | | | RC | | |
| 14 | | | | | | | | | | | | | SD | | |
| 14,5 | | | Encrusting | | | | | | Healthy, over dead boulder | | | | | | |
| 15 | | | | | | | | | Y Algae | | | TA | | | |
| 15,5 | | | | | | | | | Y Algae | | | TA | | | |
| 16 | | | | | | Lettuce | | | Dead, 90% | | | | | | |
| 16,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 17 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 17,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 18 | | | Boulder | | | | | | Dead, 25% | | | | | | |
| 18,5 | | | | | | | | | | | | | RC | | |
| 19 | | Mustard | | | | | | | Sick, on sick star coral | | | | | | |
| 19,5 | | | Boulder | | | | | | Sick | | | | | | |
| 20 | | | | | Finger | | | | Healthy | | | | | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **3** | **6** | **0** | **2** | **3** | **0** | **1** | 6 5 2 1 | **0** | **0** | **12** | **13** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# PORTOMAREA MARINE MONITORING

Transect No: 1, 50-70m  Visibility : 30m  Observers: Maryke, Marjo
Date : 18/01/02  Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | Encrusting on star coral | | BRO | | | | |
| 1 | | | | | | Lettuce | | | Healthy | | | | | | |
| 1,5 | | | | | | | | | | | | | SD/RB | | |
| 2 | | | | | | | | | | | | | SD | | |
| 2,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 3 | | | | | | | | | Encrusting | | BRO | | | | |
| 3,5 | | | | | | | | | Y Algae | | | TA | | | |
| 4 | | | Boulder | | | | | | Dead, 80% | | | | | | |
| 4,5 | | | | | | | | | | | | | RB | | |
| 5 | | | | | | | | | Y Algae | | | TA | | | |
| 5,5 | | | | | | Lettuce | | | Dead, 40% | | | | | | |
| 6 | | | | | | | | | Y Algae | | | TA | | | |
| 6,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 7 | | | | | | | | | | | | | RC | | |
| 7,5 | | | | | | | | | Y Algae | | | TA | | | |
| 8 | | | | | | | | | Blue Green Algae | | | | SD | | |
| 8,5 | | | | | | | | | | | | | SD | | |
| 9 | | | | | | | | | | | | | SD | | |
| 9,5 | | | | | | | | | | | | | SD | | |
| 10 | | | | | | | | | | | | | SD | | |
| 10,5 | | | | | | | | | | | | | SD | | |
| 11 | | | | | | | | | | | | | SD | | |
| 11,5 | | | | Boulder | | | | | Healthy | | | | | | |
| 12 | | | Boulder | | | | | | Healthy | | | | | | |
| 12,5 | | | Boulder | | | | | | Dead, 60% | | | | | | |
| 13 | | | Boulder | | | | | | Dead, 95% | | | | | | |
| 13,5 | | | | | | | | | | | | | RC | | |
| 14 | | | | | | | | | | | | | RC | | |
| 14,5 | | | Boulder | | | | | | Dead, 80% | | | | | | |
| 15 | | | Boulder | | | | | | Dead, 100% | | | | | | |
| 15,5 | | | | | | | | | | Sea Plume | | | | | |
| 16 | | | | | | | | | | | | | SD | | |
| 16,5 | | | | | | | | | | | | | SD | | |
| 17 | | | Boulder | | | | | | Dead, 70% | | | | | | |
| 17,5 | | | | | | | | | | | | | SD | | |
| 18 | | | | | | | | | | | | | SD | | |
| 18,5 | | | | | | | | | | | | | SD | | |
| 19 | | | | | | | | | | | | | SD | | |
| 19,5 | | | | | | | | | | | | | SD | | |
| 20 | | | | | | | | | | | | | SD | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **9** | **1** | **0** | **2** | **0** | **0** | 7 5 0 0 | **1** | **2** | **4** | **21** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

Coral transect #1

#1, 50-70m

# Portomarea Marine Monitoring

Transect No: 1, 75-95m  Visibility : 30m  Observers: Maryke, Marjo
Date : 18/01/02  Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 1 | | | | | | | | | | | | | SD | | |
| 1,5 | | | | | | | | | | | | | SD | | |
| 2 | | | | | | | | | | | | | SD/RB | | |
| 2,5 | | | | | | | | | Y Algae | | | TA | | | |
| 3 | | | | | | | | | | | | | RC | | |
| 3,5 | | | | | | | | | | | | | RC | | |
| 4 | | | | | | | | | Y Algae | | | TA | | | |
| 4,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 5 | | | | | | | | | Blue Green Algae | | | | RC | | |
| 5,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 6 | | | | | | | | | | | | | RC | | |
| 6,5 | | | | | | Lettuce | | | Dead, 60% | | | | | | |
| 7 | | | | | | | | | | | | | SD | | |
| 7,5 | | | | | | | | | | | | | SD | | |
| 8 | | | | | | | | | | | | | SD | | |
| 8,5 | | | | | | | | | | | | | SD | | |
| 9 | | | | | | | | | | | | | SD | | |
| 9,5 | | | | | | | | | | | | | SD | | |
| 10 | | | | | | | | | Y Algae | | | TA | | | |
| 10,5 | | | | | | | | | Y Algae | | | TA | | | |
| 11 | | | | | | | | | | | | | SD | | |
| 11,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 12 | | | | | | Lettuce | | | Dead, 50% | | | | | | |
| 12,5 | | | | | | Lettuce | | | Healthy | | | | | | |
| 13 | | | | | | | | | Y Algae | | | TA | | | |
| 13,5 | | | | | | | | | Y Algae | | | TA | | | |
| 14 | | | | | | | | | Y Algae | | | TA | | | |
| 14,5 | | | | | | | | | Y Algae | | | TA | | | |
| 15 | | | | | | | | | | | | | SD | | |
| 15,5 | | | | | | | | | Y Algae | | | TA | | | |
| 16 | | | | | | | | | | | | | SD | | |
| 16,5 | | | | | | | | | | | | | SD | | |
| 17 | | | | | | | | | | | | | SD | | |
| 17,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 18 | | | | | | | | | | | | | SD | | |
| 18,5 | | | | | | | | | Y Algae | | | TA | | | |
| 19 | | | | | | | | | | | | | RB | | |
| 19,5 | | | | | | | | | | | | | SD | | |
| 20 | | | | | | | | | | | | | SD | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **1** | **0** | **0** | **3** | **0** | **0** | 2 2 0 0 | **0** | **0** | **14** | **22** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 2, 0-20m | Visibility : 15m | Observers: Maryke, Marjo
Date : 17/01/02 | Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | Y Algae | | | TA | | | |
| 1 | | | | | | | | | | | | TA | | | |
| 1,5 | | | | Grooved | | | | | Healthy, small | | | | | | |
| 2 | | | | | | | | | | | | TA | | | |
| 2,5 | | | | | | | | | | | | | RB/SD | | |
| 3 | | | | | | | | | | | | | RC | | |
| 3,5 | | | | | | | | | | | | | SD | | |
| 4 | | | | | | | | | | | | | SD | | |
| 4,5 | | | | | | | | | | | | | SD | | |
| 5 | | | | | | | | | | | | | SD/RC | | |
| 5,5 | | | | | | | | | | | | | SD | | |
| 6 | | | | | | | | | | | | | RB/RC | | |
| 6,5 | | | | | | | | | | | | | SD/RB | | |
| 7 | | | | | | | | | | | | | SD | | |
| 7,5 | | | | | | | | | | | | | RC | | |
| 8 | | | | Grooved | | | | | Healthy | | | | | | |
| 8,5 | | | | | | | | | | | | | RC | | |
| 9 | | | | | | | | | | | | | SD | | |
| 9,5 | | | | | | | | | | | | | RC | | |
| 10 | | | | Maze | | | | | Healthy, Rose coral near it | | | | | | |
| 10,5 | | | | | | | | | | | | | SD | | |
| 11 | | | | | | | | | | | | | RC/RB | | |
| 11,5 | | | | | | | | | | | | | RC | | |
| 12 | | | | | | | | | | | | TA | | | |
| 12,5 | | | | | | | | | | | | | RB | | |
| 13 | | | | | | | | | | | | | RC/RB | | |
| 13,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 14 | | | | | | | | | | | | | RB | | |
| 14,5 | | | | | | | | | | | | | SD | | |
| 15 | | | | | | | | | | | | | SD | | |
| 15,5 | | | | | | | | | | | | | RB | | |
| 16 | | | | | | | | | | | | | SD/RB | | |
| 16,5 | | | | | | | | | | | | | RB | | |
| 17 | | | | | | | | | | | | | RB | | |
| 17,5 | | | | | | | | | | | | | RC/RB | | |
| 18 | | | | | | | | | | | | | RB/SD | | |
| 18,5 | | | | | | | | | | | | | SD | | |
| 19 | | | | | | | | | | | | | SD | | |
| 19,5 | | | | | | | | | | | | | SD | | |
| 20 | | | | | | | | | | | | | SD/RB | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | 0 3 0 0 | **0** | **0** | **5** | **32** | | |
| | 0 | 1 | 33 | 1 | 0 | 3 | 0 | 1 | 7 31 1 0 0 | 4 | 0 | 25 | 92 | **GRAND TOTAL** | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 2, 25-45m | Visibility : 15m | Observers: Maryke, Marjo
Date : 17/01/02 | Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | RB | | |
| 1 | | | | | | | | | | | | | SD/RB | | |
| 1,5 | | | | | | | | | | | | | RB | | |
| 2 | | | | | | | | | | | | | RC | | |
| 2,5 | | | | | | | | | | | | | RB/SD | | |
| 3 | | | | | | | | | | | | | RC | | |
| 3,5 | | | | | | | | | | | | | RB/RC | | |
| 4 | | | | | | | | | | | | TA | | | |
| 4,5 | | | | | | | | | | | | | SD | | |
| 5 | | | | | | | | | Y Algae | | | TA | | | |
| 5,5 | | Mustard | | | | | | | Healthy, near rock | | | | | | |
| 6 | | | | | | | | | Y Algae | | | TA | | | |
| 6,5 | | | | | | | | | | | | | SD | | |
| 7 | | | | | | | | | | | | TA | | | |
| 7,5 | | | | | | | | | | | | TA | | | |
| 8 | | | Boulder | | | | | | Healthy | | | | | | |
| 8,5 | | | | | | | | | | | | | RC | | |
| 9 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 9,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 10 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 10,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 11 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 11,5 | | | | | | | | | | | | | SD/RB | | |
| 12 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 12,5 | | | | | | | | | | | | | RC | | |
| 13 | | | | | | | | | | | | | SD | | |
| 13,5 | | | | | | | | | | | | | RB/SD | | |
| 14 | | | | | | | | | | | | | RC/RB | | |
| 14,5 | | | | | | | | | | | | | SD | | |
| 15 | | | | | | | | | | | | | RB/SD | | |
| 15,5 | | | | | | | | | | | | | RB | | |
| 16 | | | | | | | | | | | | | SD | | |
| 16,5 | | | | | | | | | | | | | RB | | |
| 17 | | | | | | | | | | | | | RB | | |
| 17,5 | | | | | | | | | Y Algae | | | TA | | | |
| 18 | | | | | | | | | | | | TA | | | |
| 18,5 | | | | | | | | | | | | | RB | | |
| 19 | | | | | | | | | | | | TA | | | |
| 19,5 | | | | | | | | | | | | | RB/SD | | |
| 20 | | | | | | | | | Y Algae | | | TA | | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **1** | **1** | **0** | **0** | **0** | **0** | **0** | 0 2 0 0 | **0** | **0** | **15** | **23** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 2, 50-70m — Visibility : 15m — Observers: Maryke, Marjo
Date : 17/01/02 — Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | SD/RB | | |
| 1 | | | | | | | | | | | | | RB | | |
| 1,5 | | | | | | | | | | | | | RC | | |
| 2 | | | | | | | | | | | | | SD/RB | | |
| 2,5 | | | | | | Lettuce | | | Healthy | | | | | | |
| 3 | | | | | | | | | | | | | RC | | |
| 3,5 | | | Boulder | | | | | | Dead, 80% | | | | | | |
| 4 | | | | | | | | | | | | | RB | | |
| 4,5 | | | Boulder | | | | | | Dead, 50% | | | | | | |
| 5 | | | | | | | | | Y Algae | | | TA | | | |
| 5,5 | | | | | | | | | | | | | SD | | |
| 6 | | | | | | | | | | | | | RB | | |
| 6,5 | | | Boulder | | | | | | Dead, 50% | | | | | | |
| 7 | | | Boulder | | | | | | Healthy | | | | | | |
| 7,5 | | | | | | | | | | | | | RB | | |
| 8 | | | | | | | | | | | | | SD | | |
| 8,5 | | | | | | | | | | | | | RC/RB | | |
| 9 | | | | | | | | | | | | | RB | | |
| 9,5 | | | | | | | | | | | | | SD | | |
| 10 | | | | | | | | | Y Algae | | | TA | | | |
| 10,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 11 | | | | | | | | | | | | | RC | | |
| 11,5 | | | Boulder | | | | | | Dead, 80% | | | | | | |
| 12 | | | | | | | | | Y Algae | | | TA | | | |
| 12,5 | | | | | | | | | | | | TA | | | |
| 13 | | | | | | | | | | | | | SD | | |
| 13,5 | | | | | | | | | | | | | SD | | |
| 14 | | | Boulder | | | | | | Healthy | | | | | | |
| 14,5 | | | Boulder | | | | | | Dead, 10% | | | | | | |
| 15 | | | Boulder | | | | | | Sick, near fire coral | | | | | | |
| 15,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 16 | | | | Symmetr. | | | | | Healthy | | | | | | |
| 16,5 | | | | | | | | | | | | | RB | | |
| 17 | | | | | | | | | | | | | SD | | |
| 17,5 | | | | | | | | | | | | | RC | | |
| 18 | | | | | | | | | | | | | RC | | |
| 18,5 | | | | | | | | | | | | | SD | | |
| 19 | | | | | | | | | | | | | SD | | |
| 19,5 | | | | | | | | Fire | Healthy, Encrusting | | | | | | |
| 20 | | | | | | | | | | | | | SD/RB | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **10** | **1** | **0** | **1** | **0** | **1** | 5 7 1 0 | **0** | **0** | **4** | **23** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 2, 75-95m | Visibility : 15m | Observers: Maryke, Marjo
Date : 18/01/02 | Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | SD | | |
| 1 | | | | | | | | | | | | | RC | | |
| 1,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 2 | | | | | | | | | Porous sea rod, healthy | Sea rod | | | | | |
| 2,5 | | | | | | | | | | | | | RC | | |
| 3 | | | | | | | | | | | | | RC/RB | | |
| 3,5 | | | | | | | | | Y Algae | | | TA | | | |
| 4 | | | | | | | | | Y Algae | | | TA | | | |
| 4,5 | | | | | | | | | Y Algae | | | TA | | | |
| 5 | | | | | | | | | | | | | SD | | |
| 5,5 | | | | | | | | | | | | | RC | | |
| 6 | | | | | | | | | Black sea rod, healthy | Sea rod | | | | | |
| 6,5 | | | | | | | | | | | | | RB | | |
| 7 | | | | | | | | | | | | | RB | | |
| 7,5 | | | | | | | | | | | | | SD | | |
| 8 | | | | | | | | | | | | | SD | | |
| 8,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 9 | | | | | | | | | | | | | SD/RB | | |
| 9,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 10 | | | | | | | | | | | | | SD/RB | | |
| 10,5 | | | Boulder | | | | | | Dead, 80% | | | | | | |
| 11 | | | | | | | | | | | | | RB | | |
| 11,5 | | | | | | | | | | | | | SD | | |
| 12 | | | Boulder | | | | | | Healthy | | | | | | |
| 12,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 13 | | | Boulder | | | | | | Healthy | | | | | | |
| 13,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 14 | | | Boulder | | | | | | Healthy | | | | | | |
| 14,5 | | | | | | | | | | | | | SD | | |
| 15 | | | | | | | | | | | | | RB | | |
| 15,5 | | | | | | | | | | | | | RB | | |
| 16 | | | | | | | | | | | | | RB | | |
| 16,5 | | | | | | | | | | | | | RB | | |
| 17 | | | Boulder | | | | | | Healthy | | | | | | |
| 17,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 18 | | | | | | | | | | | | | RB | | |
| 18,5 | | | | | | Lettuce | | | Healthy | | | | | | |
| 19 | | | | | | | | | | | | | RB | | |
| 19,5 | | | | | | | | | | | | | RC | | |
| 20 | | | | | | | | | | | | | RB | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **11** | **0** | **0** | **1** | **0** | **0** | 1 11 0 0 | **2** | **0** | **3** | **23** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 3, 0-20m | Visibility : 20m | Observers: Maryke, Marjo
Date : 17/01/02 | Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | RB/SD | | |
| 1 | | | | | | | | | | | | | RB/SD | | |
| 1,5 | | | | | | | | | | | | | SD | | |
| 2 | | | Boulder | | | | | | Dead, 90% | | | | | | |
| 2,5 | | | | | | | | | | | | | RC/RB | | |
| 3 | | | | | | | | | | Sea Plume | | | | | |
| 3,5 | | | | | | Lettuce | | | Dead, 90% | | | | | | |
| 4 | | | | | | | | | | | | | SD | | |
| 4,5 | | | | | | | | | | | | | SD/RC | | |
| 5 | | | | | | | | | | | | TA | | | |
| 5,5 | | | | | | | | | | | | TA | | | |
| 6 | | | Boulder | | | | | | Dead, 90% | | | | | | |
| 6,5 | | | | | | Lettuce | | | Healthy near fire coral. Blue G | | | | | | |
| 7 | | | | Maze | | | | | Healthy, small | | | | | | |
| 7,5 | | | | | | | | | | | | | SD | | |
| 8 | | | | | | | | | | | | | SD/RB | | |
| 8,5 | | | | Symmetr. | | | | | Healthy | | | | | | |
| 9 | | | | | | Lettuce | | | Dead, 30%. Blue Green Algae | | | | | | |
| 9,5 | | | Smooth | | | | | | Healthy. Blue Green Algae | | | | | | |
| 10 | | | Smooth | | | | | | Healthy near mustard coral | | | | | | |
| 10,5 | | | Boulder | | | | | | Dead, 40% | | | | | | |
| 11 | | | | | | Lettuce | | | Dead, 50% | | | | | | |
| 11,5 | | | | | | | | | | | | | RC | | |
| 12 | | | | Symmetr. | | | | | Dead, 30% | | | | | | |
| 12,5 | | | | Symmetr. | | | | | Dead, 30% | | | | | | |
| 13 | | | | | | | | | | | | | SD | | |
| 13,5 | | | | | | | | | | | | | SD | | |
| 14 | | | | | | | | | | | | | SD/RC | | |
| 14,5 | | | | | | | | | Porous sea rod, part. Dead | Sea Rod | | | | | |
| 15 | | | | | | | | | Porous sea rod, bush like | Sea Rod | | | | | |
| 15,5 | | | | | | | | | | | | | RC/RB | | |
| 16 | | | | | | | | | | | | | RB | | |
| 16,5 | | | | | | | | | | | | | RB/SD | | |
| 17 | | | Boulder | | | | | | Dead, 30% | | | | | | |
| 17,5 | | | Boulder | | | | | | Healthy | | | | | | |
| 18 | | | | | | | | | | | | | SD | | |
| 18,5 | | | | | | | | | | | | | SD | | |
| 19 | | | | Symmetr. | | | | | Dead, 20% | | | | | | |
| 19,5 | | | Boulder | | | | | | Dead, 100% | | | | | | |
| 20 | | | | | | | | | | | | | SD | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **8** | **5** | **0** | **4** | **0** | **0** | 11 6 0 0 | **3** | **0** | **2** | **18** | | |
| | 0 | 1 | 6 | 5 | 1 | 0 | 1 | 1 | 7 8 0 0 0 | 4 | 0 | 47 | 94 | **GRAND TOTAL** | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 3, 25-45m  Visibility : 20m  Observers: Maryke, Marjo
Date : 17/01/02  Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | SD | | |
| 1 | | | | | | | | | | | | | SD | | |
| 1,5 | | | | | | | | | | | | | SD | | |
| 2 | | | | | | | | | | | | | SD | | |
| 2,5 | | | | | | | | | Y Algae | | | TA | | | |
| 3 | | | | | | | | | | | | | RB/RC | | |
| 3,5 | | | | | | | | | | | | | SD | | |
| 4 | | | | | | | | | | | | | SD | | |
| 4,5 | | | | | | | | | | | | | SD | | |
| 5 | | | | | | | | | | | | | SD | | |
| 5,5 | | | | | | | | | | | | | SD | | |
| 6 | | | | | | | | | | | | | SD | | |
| 6,5 | | | | | | | | | | | | | SD | | |
| 7 | | | | | | | | | 10%. Dead. Sick | Sea rod | | | | | |
| 7,5 | | | | | | | | | | | | | SD | | |
| 8 | | | Boulder | | | | | | Dead, 70% | | | | | | |
| 8,5 | | | | | | | | | | | | | RC | | |
| 9 | | | | | | | | | | | | | RC | | |
| 9,5 | | | | | | | | | | | | | SD | | |
| 10 | | | | | | | | Flower | Healthy, on rock near yellow sp | | | | | | |
| 10,5 | | | | | | | | | | | | | RC | | |
| 11 | | | | | | | | | | | | | RB/SD | | |
| 11,5 | | | | | | | | | | | | | RC | | |
| 12 | | | | | | | | | | | | | RC | | |
| 12,5 | | | | | | | | | | | | | RB | | |
| 13 | | | | | | | | | Encrusting, hairy. | Sea rod | | | | | |
| 13,5 | | | | | | | | | | | | | SD | | |
| 14 | | | | | | | | | | | | | SD | | |
| 14,5 | | | | | | | | | | | | | SD/RC | | |
| 15 | | | | | | | | | | | | | RB/RC | | |
| 15,5 | | | | | | | | | | | | | RB/RC | | |
| 16 | | | | | | | | | | | | | RB/RC | | |
| 16,5 | | | | | | | | | | | | | SD | | |
| 17 | | | | | | | | | | | | | RB/RC | | |
| 17,5 | | | | | | | | | | | | | RB/RC | | |
| 18 | | | | | | | | | Y Algae | | | TA | | | |
| 18,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 19 | | | | | | | | | Y Algae | | | TA | | | |
| 19,5 | | | | | | | | | | | | | SD | | |
| 20 | | | | | | | | | | | | | SD | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | 1 1 0 0 | **2** | **0** | **4** | **32** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

# Portomarea Marine Monitoring

Transect No: 3, 50-70m  Visibility : 20m  Observers: Maryke, Marjo
Date : 17/01/02  Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | Boulder | | | | | | Dead, 50% | | | | | | |
| 1 | | | | | | | | | Y Algae | | | TA | | | |
| 1,5 | | | | | | | | | Blue Breen Algae | | | TA | | | |
| 2 | | | | Symmetr. | | | | | Dead, 95% with corraline algae | | | | | | |
| 2,5 | | | | | | | | | | | | | SD | | |
| 3 | | | | | | | | | | | | | SD/RC | | |
| 3,5 | | | | | | | | | | | | TA | | | |
| 4 | | | | | | | | | | | | | SD | | |
| 4,5 | | | | | | | | | | | | | SD/RC | | |
| 5 | | | | | | | | | | | | | RC | | |
| 5,5 | | | | | | | | | | | | | RC | | |
| 6 | | | | | | | | | | | | | SD/RC | | |
| 6,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 7 | | | | | | | | | | | | | SD | | |
| 7,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 8 | | | | | | | | | | | | | RB | | |
| 8,5 | | | | | | | | | | | | | RB | | |
| 9 | | | | | | | | | Y Algae | | | TA | | | |
| 9,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 10 | | | | | | | | | Y Algae, Blue Green Algae | | | TA | | | |
| 10,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 11 | | | | | | | | | Y Algae | | | TA | | | |
| 11,5 | | | | | | | | | | | | | RC | | |
| 12 | | | | | | | | | Y Algae | | | TA | | | |
| 12,5 | | | | | | | | | | | | | RC | | |
| 13 | | | | | | | | | Y Algae | | | TA | | | |
| 13,5 | | | | | Finger | | | | Healthy | | | | | | |
| 14 | | | | | | | | | | | | | RC | | |
| 14,5 | | Mustard | | | | | | | Healthy near brain | | | | | | |
| 15 | | | | | | | | | Y Algae | | | TA | | | |
| 15,5 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 16 | | | | | | | | | | | | | RC | | |
| 16,5 | | | | | | | | | | | | | RC | | |
| 17 | | | | | | | | | Y Algae | | | TA | | | |
| 17,5 | | | | | | | | | Encrusting | Sea rod | | | | | |
| 18 | | | | | | | | | Encrusting | Sea rod | | | | | |
| 18,5 | | | | | | | Branching | | Healthy, Encrusting | | | | | | |
| 19 | | | | | | | | | | | | | SD | | |
| 19,5 | | | | | | | | | | | | | RB | | |
| 20 | | | | | | | | | | | | | RC | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **1** | **1** | **1** | **1** | **0** | **1** | **0** | 2 3 0 0 | **2** | **0** | **15** | **18** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

Coral transect #3

#3, 50-70m

# Portomarea Marine Monitoring

Transect No: 3, 75-95m | Visibility : 20m | Observers: Maryke, Marjo
Date : 17/01/02 | Temperature: 28C

| | HARD CORALS | | | | | | | | CONDITION/REMARKS | SOFT CORALS/OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | Branching | Mound | Star | Brain | Finger | Leaf | Fire Coral | Other Coral | | Gorgonians | Sponges | Algae | Abiotics | | |
| 0,5 | | | | | | | | | | | | | SD/RC | | |
| 1 | | | | | | | | | | | | | RB | | |
| 1,5 | | | | | | | | | | | | | RB | | |
| 2 | | | | | | | | | | | | | RC | | |
| 2,5 | | | | | | | | | Y Algae | | | TA | | | |
| 3 | | | | | | | | | | | | | SD/RB | | |
| 3,5 | | | | | | | | | | | | | RB | | |
| 4 | | | | | | | | | Y Algae | | | TA | | | |
| 4,5 | | | | | | | | | | | | | RC | | |
| 5 | | | Boulder | | | | | | Dead, 90% | | | | | | |
| 5,5 | | | | | | | | | | | | | RC | | |
| 6 | | | | | | | | | | | | | RB | | |
| 6,5 | | | | | | | | | | | | | RC | | |
| 7 | | | | | | | | | | | | TA | | | |
| 7,5 | | | | Grooved | | | | | Healthy | | | | | | |
| 8 | | | | | | | | | | | | TA | | | |
| 8,5 | | | | | | | | | | | | | RC/RB | | |
| 9 | | | | Symmetr. | | | | | Dead, 50% | | | | | | |
| 9,5 | | | | | | | | | Y Algae | | | TA | | | |
| 10 | | | | | | | | | | | | | RB | | |
| 10,5 | | | | | | | | | | | | TA | | | |
| 11 | | | | | | | | | Y Algea | | | TA | | | |
| 11,5 | | | | | | | | | | | | | RB | | |
| 12 | | | | | | | | | | | | | SD | | |
| 12,5 | | | | | | | | | Y Algae | | | TA | | | |
| 13 | | | | | | | | | | | | | RB | | |
| 13,5 | | | | | | | | | | | | TA | | | |
| 14 | | | Boulder | | | | | | Healthy | | | | | | |
| 14,5 | | | | | | | | | Y Algae | | | TA | | | |
| 15 | | | | | | | | | | | | TA | | | |
| 15,5 | | | | | | | | | | | | | RC | | |
| 16 | | | | | | | | | | | | | RC | | |
| 16,5 | | | | | | | | | | | | | RC | | |
| 17 | | | | | | | | | Blue Green Algae | | | TA | | | |
| 17,5 | | | | | | | | | Y Algae | | | TA | | | |
| 18 | | | | | | | | | | | | | RB | | |
| 18,5 | | | | | | | | | Y Algae | | | TA | | | |
| 19 | | | | | | | | | | | | | RB | | |
| 19,5 | | | | | | | | | | | | | SD | | |
| 20 | | | | | | | | | | | | | RB/SD | | |
| | | | | | | | | | PD H S BL | | | | | | |
| **Total** | **0** | **0** | **2** | **2** | **0** | **0** | **0** | **0** | 2 2 0 0 | **0** | **0** | **14** | **22** | | |

Substrate code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | CA | Coralline Algae | | |

## PORTOMAREA MARINE MONITORING

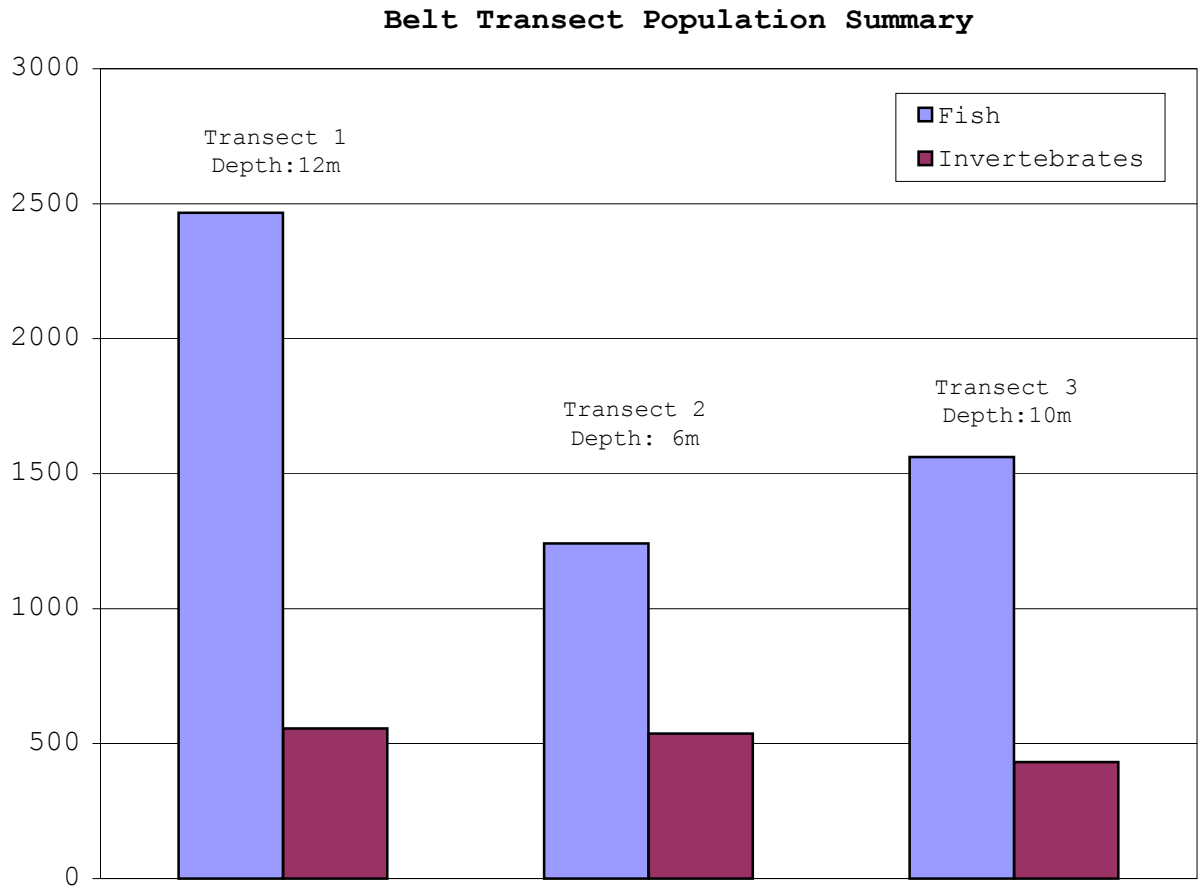
### ATLANTIC BELT TRANSECT SUMMARY: FISH and INVERTEBRATES

Date: January,2002
Data collected by: Marjo van den Bulck & Maryke Kolenousky

| PORTOMARI Atlantic Belt Transects | | West side of Bay | | East side | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|
| Fish | | Transect 1 Depth:12m | Transect 2 Depth: 6m | Transect 3 Depth:10m | | | |
| **ANGELFISH** | French Angelfish | | 4 | 1 | 5 | 1,67 | 2,08 |
| | Queen Angelfish | 1 | | | 1 | 0,33 | 0,58 |
| | Rock Beauty | 2 | | 2 | 4 | 1,33 | 1,15 |
| **BASSLET** | Fairy Basslet | 13 | | 8 | 21 | 7,00 | 6,56 |
| **BOXFISH** | Honeycomb Cowfish | | 1 | | 1 | 0,33 | 0,58 |
| | Smooth Trunkfish | 1 | | 2 | 3 | 1,00 | 1,00 |
| | Spotted Trunkfish | 3 | 3 | 4 | 10 | 3,33 | 0,58 |
| **BUTTERFLYFISH** | Banded Butterflyfish | 2 | | | 2 | 0,67 | 1,15 |
| | Foureye Butterflyfish | | 1 | 5 | 6 | 2,00 | 2,65 |
| | Longsnout Butterflyfish | 3 | | | 3 | 1,00 | 1,73 |
| **CHROMIS** | Blue Chromis | 88 | | 9 | 97 | 32,33 | 48,42 |
| | Brown Chromis | 1565 | 208 | 380 | 2153 | 717,67 | 738,83 |
| **DAMSELFISH** | Bicolor Damselfish | 198 | 590 | 545 | 1333 | 444,33 | 214,51 |
| | Cocoa Damselfish | | 19 | 7 | 26 | 8,67 | 9,61 |
| | Dusky Damselfish | | 3 | 22 | 25 | 8,33 | 11,93 |
| | Sergeant Major | | 2 | 5 | 7 | 2,33 | 2,52 |
| | Threespot Damselfish | 105 | 43 | 31 | 179 | 59,67 | 39,72 |
| | Yellowtail Damselfish | 6 | 3 | 4 | 13 | 4,33 | 1,53 |
| **DRUM** | Spotted Drum | 5 | | | 5 | 1,67 | 2,89 |
| **EEL** | Goldentail Moray | | 1 | 3 | 4 | 1,33 | 1,53 |
| | Spotted Moray | 2 | | 6 | 8 | 2,67 | 3,06 |
| **FILEFISH** | Orangespotted Filefish | 1 | | | 1 | 0,33 | 0,58 |
| **FLOUNDER** | Peacock Flounder | | 1 | 1 | 2 | 0,67 | 0,58 |
| **GOATFISH** | Spotted Goatfish | | 1 | 2 | 3 | 1,00 | 1,00 |
| | Yellow Goatfish | 34 | 13 | 46 | 93 | 31,00 | 16,70 |
| **GOBY** | Bridled Goby | 76 | 77 | 155 | 308 | 102,67 | 45,32 |
| | Neon Goby | 1 | | | 1 | 0,33 | 0,58 |
| | Peppermint Goby | 10 | 2 | 10 | 22 | 7,33 | 4,62 |
| **GROUPER** | Coney | | 2 | 4 | 6 | 2,00 | 2,00 |
| | Graysby | 27 | 7 | 7 | 41 | 13,67 | 11,55 |
| | Red Hind | 3 | | 12 | 15 | 5,00 | 6,24 |
| | Tiger Grouper (.6m) | | | 1 | 1 | 0,33 | 0,58 |
| **GRUNT** | Bluestriped | 27 | 2 | 5 | 34 | 11,33 | 13,65 |
| | French | 36 | 16 | 23 | 75 | 25,00 | 10,15 |
| **HAMLET** | Barred Hamlet | 7 | | | 7 | 2,33 | 4,04 |
| | Butter Hamlet | | 2 | 6 | 8 | 2,67 | 3,06 |
| | Yellowtail Hamlet | 12 | | 7 | 19 | 6,33 | 6,03 |
| **HOGFISH** | Spanish Hogfish | 3 | 2 | | 5 | 1,67 | 1,53 |
| **JACK** | Bar Jack | 1 | | | 1 | 0,33 | 0,58 |
| **PARROTFISH** | Blue Parrotfish (all juveniles) | 1 | 1 | 4 | 6 | 2,00 | 1,73 |
| | Princess Parrotfish | 53 | 19 | 43 | 115 | 38,33 | 17,47 |
| | Queen Parrotfish | 18 | 6 | 23 | 47 | 15,67 | 8,74 |
| | Redband Parrotfish | 13 | 6 | 7 | 26 | 8,67 | 3,79 |
| | Stoplight Parrotfish | 24 | 6 | 19 | 49 | 16,33 | 9,29 |
| **PUFFER** | Balloonfish | 4 | | | 4 | 1,33 | 2,31 |
| | Sharpnose Puffer | 7 | 5 | 4 | 16 | 5,33 | 1,53 |
| **SEABASS** | Harlequin Bass | 3 | 13 | 5 | 21 | 7,00 | 5,29 |
| **SNAPPER** | Mahogany Snapper | | | 1 | 1 | 0,33 | 0,58 |
| | Schoolmaster | 2 | 2 | 2 | 6 | 2,00 | |
| | Yellowtail Snapper | 1 | | | 1 | 0,33 | 0,58 |
| **SQUIRRELFISH** | Blackbar Soldierfish | 6 | 21 | 36 | 63 | 21,00 | 15,00 |
| | Squirrelfish | 7 | 1 | 1 | 9 | 3,00 | 3,46 |
| **SURGEONFISH** | Blue Tang | 5 | 4 | 4 | 13 | 4,33 | 0,58 |
| | Doctorfish | 1 | | | 1 | 0,33 | 0,58 |
| | Ocean Surgeon | 1 | 3 | | 4 | 1,33 | 1,53 |
| **WRASSE** | Bluehead Wrasse | 27 | 93 | 44 | 164 | 54,67 | 34,27 |
| | Clown Wrasse | | 6 | | 6 | 2,00 | 3,46 |
| | Creole Wrasse | 27 | | | 27 | 9,00 | 15,59 |
| | Puddingwife | | 1 | | 1 | 0,33 | 0,58 |
| | Slippery Dick | | | 2 | 2 | 0,67 | 1,15 |
| | Yellowhead Wrasse | 30 | 50 | 45 | 125 | 41,67 | 10,41 |
| **OTHERS** | Cornetfish | 1 | | | 1 | 0,33 | 0,58 |
| | Redspotted Hawkfish | | 3 | | 3 | 1,00 | 1,73 |
| | Sand Diver | | 1 | | 1 | 0,33 | 0,58 |
| | Greater Soapfish | | 1 | | 1 | 0,33 | 0,58 |
| | Trumpetfish | 3 | | 10 | 13 | 4,33 | 5,13 |
| **TOTAL** | | **2466** | **1241** | **1562** | **5269** | **1756,33** | **635,20** |
| | **Invertebrates** | **Transect 1 Depth:12m** | **Transect 2 Depth: 6m** | **Transect 3 Depth:10m** | **Total** | **Mean** | **St.Dev.** |
| **ANEMONE** | Beaded Anemone | 28 | 23 | 7 | 58 | 19,33 | 10,97 |
| | Corkscrew Anemone | 2 | 9 | 9 | 20 | 6,67 | 4,04 |
| | Giant Anemone | 5 | 62 | 42 | 109 | 36,33 | 28,92 |
| **TUBE WORMS** | Christmas tree Worms | 400 | 333 | 310 | 1043 | 347,67 | 46,76 |
| | Split Crown Feather Duster | 48 | | 24 | 72 | 24,00 | 24,00 |
| | Magnificent Feather Duster | 3 | 10 | 7 | 20 | 6,67 | 3,51 |
| | Variegated Feather Duster | 31 | 70 | 19 | 120 | 40,00 | 26,66 |
| **CRUSTACEANS** | Banded Coral Shrimp | 2 | | 2 | 4 | 1,33 | 1,15 |
| | Pederson Cleaner Shrimp | 33 | 13 | 7 | 53 | 17,67 | 13,61 |
| | Red Snapping Shrimp | | | 4 | 4 | 1,33 | 2,31 |
| | Spotted Cleaner Shrimp | 1 | | | 1 | 0,33 | 0,58 |
| | Yellowline Arrow Crab | 1 | 1 | | 2 | 0,67 | 0,58 |
| **MOLLUSKS** | Rough File Clam | | 11 | | 11 | 3,67 | 6,35 |
| | Spiny File Clam (12cm) | | 1 | | 1 | 0,33 | 0,58 |
| **ECHINODERMS** | Reef Urchin | 2 | 3 | | 5 | 1,67 | 1,53 |
| | Tigertail Sea Cucumber | | 1 | 1 | 2 | 0,67 | 0,58 |
| **TOTAL** | | **556** | **537** | **432** | **1525,00** | **508,33** | **66,79** |

# PORTOMAREA MARINE MONITORING

## ATLANTIC BELT TRANSECT FISH AND INVERTEBRATE SUMMARY



## PORTOMAREA MARINE MONITORING

### ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

**Transect #1, Depth: 12m**

Date: Jan.14,2002 Time: 9.26a.m.

Data collected by: Marjo van den Bulck & Maryke Kolenousky

| Atlantic Belt Transect: Fish | | 0-20m | 25-45m | 50-70m | 75-100m | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|---|
| **ANGELFISH** | Queen Angelfish | | 1 | | | 1 | 0,25 | 0,50 |
| | Rock Beauty | | 2 | | | 2 | 0,50 | 1,00 |
| **BARRACUDA** | | | | | | | | |
| **BASSLET** | Fairy Basslet | 7 | 3 | 2 | 1 | 13 | 3,25 | 2,63 |
| **BIGEYE** | | | | | | | | |
| **BLENNY** | | | | | | | | |
| **BOXFISH** | Smooth Trunkfish | | 1 | | | 1 | 0,25 | 0,50 |
| | Spotted Trunkfish | | | | 3 | 3 | 0,75 | 1,50 |
| **BUTTERFLYFISH** | Banded Butterflyfish | | | | 2 | 2 | 0,50 | 1,00 |
| | Longsnout Butterflyfish | 1 | 2 | | | 3 | 5 | 0,96 |
| **CARDINALFISH** | | | | | | | | |
| **CHROMIS** | Blue Chromis | 50 | 9 | 16 | 13 | 88 | 22,00 | 18,89 |
| | Brown Chromis | 630 | 450 | 245 | 240 | 1565 | 391,25 | 186,83 |
| **DAMSELFISH** | Bicolor | 55 | 53 | 50 | 40 | 198 | 49,50 | 6,66 |
| | Threespot | 34 | 20 | 28 | 23 | 105 | 26,25 | 6,13 |
| | Yellowtail | 4 | 2 | | | 6 | 1,50 | 1,91 |
| **DRUM** | Spotted Drum | 1 | 1 | 3 | | 5 | 1,25 | 1,26 |
| **EEL** | Spotted Moray | 1 | | 1 | | 2 | 0,50 | 0,58 |
| **FILEFISH** | Orangespotted Filefish | | 1 | | | 1 | 0,25 | 0,50 |
| **FLOUNDER** | | | | | | | | |
| **GOATFISH** | Yellow Goatfish | 2 | 16 | 9 | 7 | 34 | 8,50 | 5,80 |
| **GOBY** | Bridled Goby | 12 | 3 | 18 | 43 | 76 | 19,00 | 17,15 |
| | Neon Goby | | | | 1 | 1 | 0,25 | 0,50 |
| | Peppermint Goby | | | | 10 | 10 | 2,50 | 5,00 |
| **GROUPER** | Graysby | 5 | 12 | 5 | 5 | 27 | 6,75 | 3,50 |
| | Red Hind | | 2 | 1 | | 3 | 0,75 | 0,96 |
| **GRUNT** | Bluestriped | | | 6 | 21 | 27 | 6,75 | 9,91 |
| | French | 30 | 3 | 2 | 1 | 36 | 9,00 | 14,02 |
| **HAMLET** | Barred Hamlet | | 5 | 2 | | 7 | 1,75 | 2,36 |
| | Yellowtail Hamlet | 3 | 2 | 4 | 3 | 12 | 3,00 | 0,82 |
| **HOGFISH** | Spanish Hogfish | 2 | 1 | | | 3 | 0,75 | 0,96 |
| **JACK** | Bar Jack | 1 | | | | 1 | 0,25 | 0,50 |
| **PARROTFISH** | Blue Parrotfish | | 1 | | | 1 | 0,25 | 0,50 |
| | Princess Parrotfish | 17 | 11 | 12 | 13 | 53 | 13,25 | 2,63 |
| | Queen Parrotfish | 6 | 3 | 4 | 5 | 18 | 4,50 | 1,29 |
| | Redband Parrotfish | 4 | 3 | | 6 | 13 | 3,25 | 2,50 |
| | Stoplight Parrotfish | 4 | 4 | 4 | 12 | 24 | 6,00 | 4,00 |
| **PUFFER** | Balloonfish | 2 | 2 | | | 4 | 1,00 | 1,15 |
| | Sharpnose Puffer | 2 | 2 | 3 | | 7 | 1,75 | 1,26 |
| **RAY** | | | | | | | | |
| **SCORPIONFISH** | | | | | | | | |
| **SEABASS** | Harlequin Bass | 1 | | 2 | | 3 | 0,75 | 0,96 |
| **SNAPPER** | Schoolmaster | | 2 | | | 2 | 0,50 | 1,00 |
| | Yellowtail Snapper | 1 | | | | 1 | 0,25 | 0,50 |
| **SQUIRRELFISH** | Blackbar Soldierfish | 1 | 2 | 2 | 1 | 6 | 1,50 | 0,58 |
| | Squirrelfish | 5 | 1 | | 1 | 7 | 1,75 | 2,22 |
| **SURGEONFISH** | Blue Tang | 1 | 1 | 3 | | 5 | 1,25 | 1,26 |
| | Doctorfish | | | 1 | | 1 | 0,25 | 0,50 |
| | Ocean Surgeon | | | 1 | | 1 | 0,25 | 0,50 |
| **WRASSE** | Bluehead Wrasse | 3 | 8 | 10 | 6 | 27 | 6,75 | 2,99 |
| | Creole Wrasse | 6 | 20 | 1 | | 27 | 6,75 | 9,22 |
| | Yellowhead Wrasse | 3 | 9 | 6 | 12 | 30 | 7,50 | 3,87 |
| **OTHERS** | Cornetfish | | 1 | | | 1 | 0,25 | 0,50 |
| | Trumpetfish | 1 | 1 | | 1 | 3 | 0,75 | 0,50 |
| **TOTAL** | | **895** | **660** | **441** | **470** | **2466** | **616,50** | |
| **Atlantic Belt Transect: Invertebrates** | | **0-20m** | **25-45m** | **50-70m** | **75-100m** | **Total** | **Mean** | **St.Dev.** |
| **ANEMONE** | Beaded Anemone | 9 | 5 | 7 | 7 | 28 | 7,00 | 1,63 |
| | Corkscrew Anemone | 1 | 1 | | | 2 | 0,50 | 0,58 |
| | Giant Anemone | 1 | 1 | 2 | 1 | 5 | 1,25 | 0,50 |
| **TUBE WORMS** | Christmas tree Worms | 120 | 81 | 99 | 100 | 400 | 100,00 | 15,94 |
| | Split Crown Feather Duster | 6 | | 30 | 12 | 48 | 12,00 | 12,96 |
| | Magnificent Feather Duster | 2 | | | 1 | 3 | 0,75 | 0,96 |
| | Variegated Feather Duster | | 16 | 10 | 5 | 31 | 7,75 | 6,85 |
| **CRUSTACEANS** | Banded Coral Shrimp | | | 2 | | 2 | 0,50 | 1,00 |
| | Pederson Cleaner Shrimp | 10 | 4 | 10 | 9 | 33 | 8,25 | 2,87 |
| | Spotted Cleaner Shrimp | | | 1 | | 1 | 0,25 | 0,50 |
| | Yellowline Arrow Crab | 1 | | | | 1 | 0,25 | 0,50 |
| **MOLLUSKS** | Spiny File Clam (12cm) | | 1 | | | 1 | 0,25 | 0,50 |
| **ECHINODERMS** | Reef Urchin | | | 2 | | 2 | 0,50 | 1,00 |
| **TOTAL** | | **150** | **109** | **163** | **135** | **557** | **139,25** | |

## PORTOMAREA MARINE MONITORING

### ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

**Transect #2, Depth: 6m**

Date: January 16, Time: 9:15a.m.

Data collected by: Marjo van den Bulck & Maryke Kolenousky

| Atlantic Belt Transect: Fish | | 0-20m | 25-45m | 50-70m | 75-100m | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|---|
| ANGELFISH | French Angelfish | | 2 | | 2 | 4 | 1,00 | 1,15 |
| BARRACUDA | | | | | | | | |
| BASSLET | | | | | | | | |
| BIGEYE | | | | | | | | |
| BLENNY | | | | | | | | |
| | | | | | | | | |
| BOXFISH | Honeycomb Cowfish | | | | 1 | 1 | 0,25 | 0,50 |
| | Spotted Trunkfish | 1 | 2 | | | 3 | 0,75 | 0,96 |
| BUTTERFLYFISH | Foureye Butterflyfish | | 1 | | | 1 | 0,25 | 0,50 |
| CARDINALFISH | | | | | | | | |
| CHROMIS | Brown Chromis | 10 | 50 | 48 | 100 | 208 | 52,00 | 36,91 |
| DAMSELFISH | Bicolor Damselfish | 98 | 292 | 112 | 88 | 590 | 147,50 | 96,83 |
| | Cocoa Damselfish | 1 | 1 | 11 | 6 | 19 | 4,75 | 4,79 |
| | Dusky Damselfish | 2 | | | 1 | 3 | 0,75 | 0,96 |
| | Sergeant Major | | 1 | 1 | | 2 | 0,50 | 0,58 |
| | Threespot Damselfish | | 2 | 19 | 22 | 43 | 10,75 | 11,35 |
| | Yellowtail Damselfish | | 3 | | | 3 | 0,75 | 1,50 |
| DRUM | | | | | | | | |
| EEL | Goldentail Moray | | | | 1 | 1 | 0,25 | 0,50 |
| FILEFISH | | | | | | | | |
| FLOUNDER | Peacock Flounder | 1 | | | | 1 | 0,25 | 0,50 |
| GOATFISH | Spotted Goatfish | | | | 1 | 1 | 0,25 | 0,50 |
| | Yellow Goatfish | | 2 | 10 | 1 | 13 | 3,25 | 4,57 |
| GOBY | Bridled Goby | 31 | 2 | 18 | 26 | 77 | 19,25 | 12,69 |
| | Peppermint Goby | 1 | 1 | | | 2 | 0,50 | 0,58 |
| GROUPER | Coney | 2 | | | | 2 | 0,50 | 1,00 |
| | Graysby | 1 | | 2 | 4 | 7 | 1,75 | 1,71 |
| GRUNT | Bluestriped Grunt | | 1 | 1 | | 2 | 0,50 | 0,58 |
| | French Grunt | 3 | 2 | 6 | 5 | 16 | 4,00 | 1,83 |
| HAMLET | Butter Hamlet | | | 2 | | 2 | 0,50 | 1,00 |
| HOGFISH | Spanish Hogfish | 1 | | 1 | | 2 | 0,50 | 0,58 |
| JACK | | | | | | | | |
| PARROTFISH | Blue Parrotfish | | | 1 | | 1 | 0,25 | 0,50 |
| | Princess Parrotfish | 3 | 2 | 7 | 7 | 19 | 4,75 | 2,63 |
| | Queen Parrotfish | 2 | 2 | 1 | 1 | 6 | 1,50 | 0,58 |
| | Redband Parrotfish | | 4 | 2 | | 6 | 1,50 | 1,91 |
| | Stoplight Parrotfish | 3 | | 2 | 1 | 6 | 1,50 | 1,29 |
| PUFFER | Sharpnose Puffer | | 2 | 2 | 1 | 5 | 1,25 | 0,96 |
| RAY | | | | | | | | |
| SCORPIONFISH | | | | | | | | |
| SEABASS | Harlequin Bass | 1 | 7 | | 5 | 13 | 3,25 | 3,30 |
| SNAPPER | Schoolmaster | | | 1 | 1 | 2 | 0,50 | 0,58 |
| SQUIRRELFISH | Blackbar Soldier | | 2 | 7 | 12 | 21 | 5,25 | 5,38 |
| | Squirrelfish | | | | 1 | 1 | 0,25 | 0,50 |
| SURGEONFISH | Blue Tang | | | 2 | 2 | 4 | 1,00 | 1,15 |
| | Ocean Surgeon | | 3 | | | 3 | 0,75 | 1,50 |
| WRASSE | Bluehead Wrasse | 11 | 55 | 13 | 14 | 93 | 23,25 | 21,20 |
| | Clown Wrasse | | 6 | | | 6 | 1,50 | 3,00 |
| | Puddingwife | | 1 | | | 1 | 0,25 | 0,50 |
| | Yellowhead Wrasse | 7 | 17 | 9 | 17 | 50 | 12,50 | 5,26 |
| OTHERS | Redspotted Hawkfish | 3 | | | | 3 | 0,75 | 1,50 |
| | Sand Diver | | | 1 | | 1 | 0,25 | 0,50 |
| | Greater Soapfish | | | 1 | | 1 | 0,25 | 0,50 |
| **TOTAL** | | **182** | **463** | **280** | **320** | **1245** | **311,25** | |

| Atlantic Belt Transect: Invertebrates | | 0-20m | 25-45m | 50-70m | 75-100m | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|---|
| ANEMONE | Beaded Anemone | | 1 | 12 | 10 | 23 | 5,75 | 6,13 |
| | Carpet Anemone | | | | 2 | 2 | 0,50 | 1,00 |
| | Corkscrew Anemone | 2 | 2 | 3 | 2 | 9 | 2,25 | 0,50 |
| | Giant Anemone | 18 | 20 | 10 | 14 | 62 | 15,5 | 4,43 |
| TUBE WORMS | Christmas tree Worms | 70 | 66 | 97 | 100 | 333 | 83,25 | 17,73 |
| | Variegated Feather Duster | 18 | 20 | 20 | 12 | 70 | 17,5 | 3,79 |
| | Magnificent Feather Duster | 3 | 5 | | 2 | 10 | 2,50 | 2,08 |
| CRUSTACEANS | Pederson Cleaner Shrimp | 4 | 3 | 4 | 2 | 13 | 3,25 | 0,96 |
| | Yellowline Arrow Crab | | | 1 | | 1 | 0,25 | 0,50 |
| MOLLUSKS | Rough Fileclam | 1 | | 4 | 6 | 11 | 2,75 | 2,75 |
| ECHINODERMS | Reef Urchin | 1 | | | 2 | 3 | 0,75 | 0,96 |
| | Tigertail Sea Cucumber | | | | 1 | 1 | 0,25 | 0,50 |
| **TOTAL** | | **369** | **694** | **539** | **595** | **2197** | **549,25** | |

## PORTOMAREA MARINE MONITORING

### ATLANTIC BELT TRANSECT: FISH and INVERTEBRATES

**Transect #3, Depth: 10m**
Date: January 15, 2002
Data collected by: Marjo van den Bulck & Maryke Kolenousky

| Atlantic Belt Transect: Fish | | 0-20m | 25-45m | 50-70m | 75-100m | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|---|
| ANGELFISH | French Angelfish | | | 1 | | 1 | 0,25 | 0,50 |
| | Rock Beauty | | 1 | 1 | | 2 | 0,50 | 0,58 |
| BARRACUDA | | | | | | | | |
| BASSLET | Fairy Basslet | 2 | | 5 | 1 | 8 | 2,00 | 2,16 |
| BIGEYE | | | | | | | | |
| BLENNY | | | | | | | | |
| BOXFISH | Smooth Trunkfish | 1 | 1 | | | 2 | 0,50 | 0,58 |
| | Spotted Trunkfish | 1 | 3 | | | 4 | 1,00 | 1,41 |
| BUTTERFLYFISH | Foureye Butterflyfish | 1 | 1 | 3 | | 5 | 1,25 | 1,26 |
| CARDINALFISH | | | | | | | | |
| CHROMIS | Blue Chromis | 2 | | 4 | 3 | 9 | 2,25 | 1,71 |
| | Brown Chromis | 190 | 120 | 70 | | 380 | 95,00 | 80,21 |
| DAMSELFISH | Bicolor Damselfish | 72 | 221 | 147 | 105 | 545 | 136,25 | 64,30 |
| | Cocoa Damselfish | 1 | | 1 | 5 | 7 | 1,75 | 2,22 |
| | Dusky Damselfish | 1 | | 4 | 17 | 22 | 5,50 | 7,85 |
| | Sergeant Major | 5 | | | | 5 | 1,25 | 2,50 |
| | Threespot Damselfish | 17 | 6 | 4 | 4 | 31 | 7,75 | 6,24 |
| | Yellowtail Damselfish | 3 | 1 | | | 4 | 1,00 | 1,41 |
| DRUM | | | | | | | | |
| EEL | Goldentail Moray | | 1 | 2 | | 3 | 0,75 | 0,96 |
| | Spotted Moray | 1 | 2 | 2 | 1 | 6 | 1,50 | 0,58 |
| FILEFISH | | | | | | | | |
| FLOUNDER | Peacock Flounder | | | 1 | | 1 | 0,25 | 0,50 |
| GOATFISH | Spotted Goatfish | | 1 | | 1 | 2 | 0,50 | 0,58 |
| | Yellow Goatfish | 15 | 12 | 19 | | 46 | 11,50 | 8,19 |
| GOBY | Bridled Goby | 46 | 64 | 42 | 3 | 155 | 38,75 | 25,68 |
| | Peppermint Goby | | 6 | 4 | | 10 | 2,50 | 3,00 |
| GROUPER | Coney | | | 1 | 3 | 4 | 1,00 | 1,41 |
| | Graysby | 6 | 1 | | | 7 | 1,75 | 2,87 |
| | Red Hind | | 5 | 6 | 1 | 12 | 3,00 | 2,94 |
| | Tiger Grouper (.6m) | | 1 | | | 1 | 0,25 | 0,50 |
| GRUNT | Bluestriped Grunt | 1 | 2 | 1 | 1 | 5 | 1,25 | 0,50 |
| | French Grunt | 5 | 4 | 6 | 8 | 23 | 5,75 | 1,71 |
| HAMLET | Butter Hamlet | 4 | 1 | 1 | | 6 | 1,50 | 1,73 |
| | Yellowtail Hamlet | 2 | 3 | 1 | 1 | 7 | 1,75 | 0,96 |
| HOGFISH | | | | | | | | |
| JACK | | | | | | | | |
| PARROTFISH | Blue Parrotfish | 2 | | 1 | 1 | 4 | 1,00 | 0,82 |
| | Princess Parrotfish | 29 | 10 | 2 | 2 | 43 | 10,75 | 12,74 |
| | Queen Parrotfish | 11 | 4 | 8 | | 23 | 5,75 | 4,79 |
| | Redband Parrotfish | 4 | | | 3 | 7 | 1,75 | 2,06 |
| | Stoplight Parrotfish | 5 | 2 | 3 | 9 | 19 | 4,75 | 3,10 |
| PUFFER | Sharpnose Puffer | | 1 | | 3 | 4 | 1,00 | 1,41 |
| RAY | | | | | | | | |
| SCORPIONFISH | | | | | | | | |
| SEABASS | Harlequin Bass | 3 | | | 2 | 5 | 1,25 | 1,50 |
| SNAPPER | Mahogany Snapper | | | 1 | | 1 | 0,25 | 0,50 |
| | Schoolmaster | | | 2 | | 2 | 0,50 | 1,00 |
| SQUIRRELFISH | Blackbar Soldierfish | 16 | 2 | 3 | 15 | 36 | 9,00 | 7,53 |
| | Squirrelfish | 1 | | | | 1 | 0,25 | 0,50 |
| SURGEONFISH | Blue Tang | 1 | 1 | | 2 | 4 | 1,00 | 0,82 |
| WRASSE | Bluehead Wrasse | 2 | 16 | 2 | 24 | 44 | 11,00 | 10,89 |
| | Slippery Dick | | 2 | | | 2 | 0,50 | 1,00 |
| | Yellowhead Wrasse | 13 | 12 | 12 | 8 | 45 | 11,25 | 2,22 |
| OTHERS | Trumpetfish | 5 | 3 | 2 | | 10 | 2,50 | 2,08 |
| | | | | | | | | |
| **TOTAL** | | **468** | **510** | **362** | **223** | **1563** | **390,75** | |
| **Atlantic Belt Transect: Invertebrates** | | **0-20m** | **25-45m** | **50-70m** | **75-100m** | **Total** | **Mean** | **St.Dev.** |
| ANEMONE | Giant Anemone | 9 | 11 | 17 | 5 | 42 | 10,50 | 5,00 |
| | Corkscrew Anemone | 3 | 3 | 3 | | 9 | 2,25 | 1,50 |
| | Beaded Anemone | 3 | 1 | 2 | 1 | 7 | 1,75 | 0,96 |
| | Carpet Anemone | 1 | | | | 1 | 0,25 | 0,50 |
| TUBE WORMS | Magnificent Feather Duster | | 2 | 1 | 4 | 7 | 1,75 | 1,71 |
| | Split Crown Feather Duster | | 4 | 8 | 12 | 24 | 6,00 | 5,16 |
| | Variegated Feather Duster | | 6 | 7 | 6 | 19 | 4,75 | 3,20 |
| | Christmas tree worm | 114 | 45 | 59 | 92 | 310 | 77,50 | 31,31 |
| CRUSTACEANS | Pederson Cleaner Shrimp | 4 | 3 | | | 7 | 1,75 | 2,06 |
| | Red Snapping Shrimp | 4 | | | | 4 | 1,00 | 2,00 |
| | Banded Coral Shrimp | 2 | | | | 2 | 0,50 | 1,00 |
| ECHINODERMS | Tigertail Sea Cucumber | | | | 1 | 1 | 0,25 | 0,50 |
| **TOTAL** | | **42** | **75** | **74,5** | **62,5** | **254** | **63,5** | |

# PORTOMAREA MARINE MONITORING
## REEF BALL CORAL PLUG SUMMARY-1

Date : January 21, 2002
Observers: Marjo van den Bulck & Maryke Kolenousky

| 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 | 6 | Leaf coral (lettuce) | NE | T | 2 | 2,5 | 3 | Y | Y | N | |
| | | | Leaf coral (lettuce) | WN | M | 3 | 2 | 2,5 | Y | Y | N | New coral growth on ball |
| | | | Leaf coral (lettuce) | N | M | 1 | 1 | 2 | Y | Y | N | Dead plug at N H(lettuce) |
| | | | Sea Rod, black | W | M | 3 | 11 | 8 | Y | N | N | |
| | | | Sea Rod, purple | ES | H | 3 | 4,5 | 3,5 | Y | Y | N | |
| | | | Staghorn coral | W | T | 19 | 13 | 15 | Y | Y | N | |
| | | | | | | | | | | | | |
| 10 R | 2 LP | 2 | Sea Rod, black | S | M | 3 | 15 | 10 | Y | Y | N | No new coral growth on ball |
| | | | Star Coral, smooth | SW | H | | 3 | 3 | N | N | N | Whitish around base? |
| | | | | | | | | | | | | |
| 10R | 3 P | 4 | Maze coral | WN | L | | 3 | 7 | N | Y | Y | Dead? Only some polyps |
| | | | Sea Rod, purple | W | T | 6 | 10 | 8 | Y | Y | N | New coral growth on ball |
| | | | Staghorn coral | NE | T | 13 | 11 | 13 | Y | Y | N | |
| | | | Star coral | NE | H | | 3 | 6 | Y | Y | N | |
| | | | | | | | | | | | | |
| 10 R | 4 O | 1 | Finger coral | W | L | 4 | 5 | 6 | Y | Y | N | Covered by slime. New coral growth |
| | | | | | | | | | | | | |
| 10R | 5 O | 3 | Sea Rod, purple | NE | H | 3 | 11 | 3,5 | N | Y | N | New coral growth on ball |
| | | | Sea Rod, white | WN | M | 7 | 7 | 6 | y | Y | N | |
| | | | Sea Rod, white | SW | H | 8 | 6 | 5 | Y | Y | N | |
| | | | | | | | | | | | | |
| 10R | 6 LP | 4 | Sea Rod, purple | NE | M | 3 | 4 | 2 | Y | Y | Y | No new coral growth on ball |
| | | | Sea Rod, purple | ES | H | 4 | 8 | 3 | Y | Y | Y | Lots of algae, sick? |
| | | | Sea Rod, white | W | H | 5 | 4 | 3,5 | N | Y | N | |
| | | | Sea Rod, white | WN | M | 6 | 7 | 4 | Y | Y | Y | Sick? |
| | | | | | | | | | | | | |
| 10R | 7 O | 0 | | | | | | | | | | No live plugs on this ball |
| | | | | | | | | | | | | |
| 10R | 8 P | 7 | Leaf coral (lettuce) | NE | H | | 2 | 1 | N | Y | N | No new coral growth on ball |
| | | | Sea Rod, black | ES | H | 2 | 12 | 8 | N | N | N | Longest branch not healthy |
| | | | Sea Rod, black | ES | M | 2 | 11 | 3 | Y | Y | N | |
| | | | Sea Rod, black | S | M | 2 | 13 | 5 | Y | Y | N | |
| | | | Sea Rod, white | E | H | 14 | 10 | 12 | Y | Y | N | |
| | | | Staghorn coral | S | T | 7 | 9 | 13 | Y | Y | N | |
| | | | Staghorn coral | W | T | 15 | 10 | 13 | Y | Y | N | |

**Codes:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CN | Cluster number | U | Ultra Ball | LP | LoPro | T | Top of the ball |
| B N/T | Ball number/type | P | Pallet Ball | O | Oyster | H | Upper third of the ball |
| LP | Number of live coral plugs | B | Bay Ball | | | M | Middle third of the ball |
| | | | | | | L | Lower third of the ball |

# PORTOMAREA MARINE MONITORING

## REEF BALL CORAL PLUG SUMMARY-2

| 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 | 5 | Finger coral | E | N | 1 | 1 | 2 | N | Y | N | Sick |
| | | | Finger coral | WN | M | 3 | 5 | 4 | Y | Y | N | Five dead plugs on ball |
| | | | Flower coral | NE | T | 2 | 1 | 2,5 | N | N | N | No new coral growth on ball |
| | | | Leaf coral ( Lettuce) | NE | M | 2 | 4 | 6 | Y | Y | N | |
| | | | Sea Rod, Black | NE | M | 1 | 4 | 0,5 | Y | N | N | |
| | | | | | | | | | | | | |
| 10 R | 10 O | 1 | Finger coral | NE | M | 4 | 4,5 | 6 | N | Y | N | No new coral growth on ball |
| | | | | | | | | | | | | |
| 10 R | 11 LP | 1 | Staghorn | N | H | 15 | 8 | 8 | Y | Y | N | No new coral growth on ball |
| | | | | | | | | | | | | |
| 10 R | 12 LP | 4 | Brain coral | WE | T | | 4,5 | 7 | N | Y | N | No new coral growth on ball |
| | | | Flower coral | NE | H | 1 | 1 | 2 | N | Y | Y | Sick? |
| | | | Flower coral | ES | L | 1 | 0,5 | 2 | N | Y | N | |
| | | | Mustard hill coral | S | T | | 2,5 | 3 | Y | N | N | |
| | | | | | | | | | | | | |
| 10 R | 13 B | 4 | Leaf coral ( Lettuce) | N | M | 1 | 1 | 3 | Y | Y | N | New coral growth on ball |
| | | | Sea Rod, Black | NW | H | 2 | 11 | 5 | N | Y | N | |
| | | | Sea Rod, Black | NW | M | 3 | 10 | 6 | N | Y | N | |
| | | | Staghorn | SW | H | 12 | 12 | 15 | Y | Y | N | |
| | | | | | | | | | | | | |
| 10 R | 14 U | 12 | Brain coral | N | L | | 3 | 4 | N | Y | N | No new coral growth on ball |
| | | | Leaf coral ( Lettuce) | W | M | | 1,5 | 2 | N | Y | N | |
| | | | Leaf coral ( Lettuce) | W | L | | 2 | 2,5 | Y | Y | N | |
| | | | Leaf coral ( Lettuce) | N | M | | 1 | 2 | N | Y | N | |
| | | | Leaf coral ( Lettuce) | NE | M | | 3 | 5 | N | Y | N | |
| | | | Leaf coral ( Lettuce) | E | L | | 3,5 | 3 | N | N | N | |
| | | | Leaf coral ( Lettuce) | S | M | | 3 | 3 | N | Y | Y | |
| | | | Leaf coral ( Lettuce) | S | L | | 3 | 3 | Y | Y | N | |
| | | | Leaf coral ( Lettuce) | SW | L | | 1,5 | 2 | Y | Y | N | |
| | | | Leaf coral ( Lettuce) | SW | M | | 2 | 2 | N | Y | Y | |
| | | | Staghorn | S | H | 5 | 4 | 6 | Y | N | N | |
| | | | Staghorn | N | H | | 4 | 6 | Y | N | N | |
| | | | | | | | | | | | | |
| 10R | 15 LP | 2 | Brain coral | SW | T | | 2,5 | 6 | N | Y | N | |
| | | | Brain coral | ES | H | | 3 | 4 | N | Y | N | |
| | | | | | | | | | | | | |
| 10R | 16 B | 2 | Brain coral | WN | H | | 3 | 4 | Y | N | N | Dead Plug on top |
| | | | Flower coral | NE | M | 1 | 0,5 | 1 | N | Y | N | New coral growth on ball |
| | | | | | | | | | | | | |
| 10R | 17 P | 3 | Leaf coral (lettuce) | E | M | | 1,5 | 1 | N | Y | Y | Plug 40% dead |
| | | | Mustard Hill coral | WN | H | | 1,5 | 1,5 | N | Y | Y | Plug 70% dead |
| | | | Pencil coral | WN | T | 2 | 2,5 | 1 | N | Y | Y | Plug 90% dead |
| | | | | | | | | | | | | No new growth. Four dead plugs |
| | | | | | | | | | | | | |
| 10R | 18 LP | 3 | Mustard hill coral | NE | H | | 1 | 1,5 | N | N | Y | Live plugs are on the unnumbered oyster |
| | | | Sea Rod, black | W | T | 2 | 3,5 | 3 | N | Y | N | Plugs on LoPro all dead |
| | | | Sea Rod, purple | NW | M | 2 | 5 | 1,5 | Y | N | Y | Turf algae on top?? |

# PORTOMAREA MARINE MONITORING

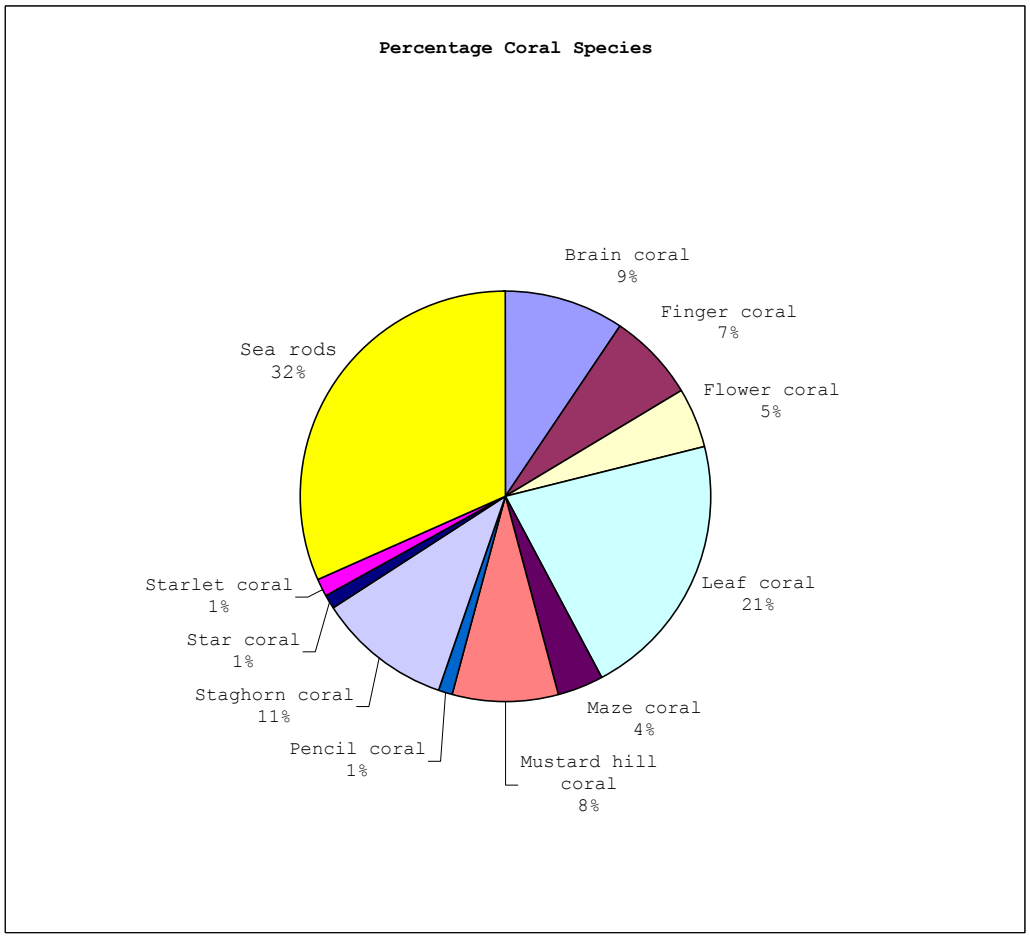
## REEF BALL CORAL PLUG SUMMARY-3

| CN | B N/T | LP | Coral Species | Plug Orientation | | Number of Branches/ Cups | Height cm | Width cm | Coral Growth on Plug Base Y/N | Algae at Base Y/N | Algae at Top Y/N | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | position | height | | | | | | | |
| 10R | 19 O | 0 | | | | | | | | | | No live plugs on ball |
| 10R | 20 O | 0 | | | | | | | | | | No live plugs on ball |
| 10R | 21 O | 0 | | | | | | | | | | Dead brain on this ball |
| 10R | 22 LP | 0 | | | | | | | | | | Dead brain on this ball |
| 10R | 23 LP | 4 | Leaf coral (lettuce) | SE | H | | 2,5 | 3,5 | Y | Y | Y | No new coral growth on ball |
| | | | Mustard hill | N | H | | 1 | 3,5 | Y | Y | Y | Sick |
| | | | Sea rod, white | NW | H | 3 | 5 | 2 | N | y | N | |
| | | | Sea rod, white | NW | M | 4 | 5 | 3,5 | N | Y | Y | |
| 10R | 24 P | 6 | Brain coral | N | T | | 5 | 5 | N | Y | Y | No new growth on ball |
| | | | Maze coral | E | M | | 4 | 4 | N | Y | N | |
| | | | Mustard hill | NE | M | | 1 | 3,5 | N | Y | Y | sick, lots of algae |
| | | | Sea rod, black | NW | T | 1 | 7,5 | 6 | N | Y | N | |
| | | | Sea rod, black | NW | H | 2 | 8,5 | 4,5 | N | Y | N | |
| | | | Staghorn coral | N | T | 10 | 6 | 8 | N | Y | Y | |
| 10R | 25 B | 1 | Mustard hill | NW | M | | 3 | 2,5 | N | Y | Y | Plug almost completely covered in algae<br>No new coral growth,one dead plug |
| 10R | 26 LP | 1 | Maze coral | W | T | | 5 | 7 | N | Y | Y | Lots of algae on base<br>No new coral growth on ball |
| 10R | 27 B | 2 | Sea Rod, black | SW | T | 2 | 11 | 3 | N | Y | N | No new coral growth,one dead plug |
| | | | Sea Rod, white | W | T | 6 | 7 | 5 | N | Y | N | |
| 10R | 28 P | 6 | Brain coral | W | M | | 1,5 | 2,5 | N | Y | Y | No new coral growth on ball |
| | | | Brain coral | E | H | | 1 | 2,5 | N | Y | Y | |
| | | | Finger coral | SW | H | 2 | 4 | 4 | N | Y | N | |
| | | | Finger coral | W | L | 2 | 4 | 3,5 | N | Y | N | ?50% bleaching? |
| | | | Leaf coral (lettuce) | W | M | 1 | 3 | 3 | N | Y | N | |
| | | | Sea Rod, black | SE | T | 2 | 3 | 4,5 | N | Y | N | |
| 10R | 29 O | 1 | Mustard hill | W | M | | 1 | 1 | Y | Y | Y | Plug 50% dead<br>No new coral growth on ball |
| 10R | 30 LP | 0 | | | | | | | | | | No live plugs. No new coral growth |
| 10R | 31 O | 0 | | | | | | | | | | New coral growth on ball. No plugs |
| 11L | | 0 | | | | | | | | | | No plugs have been placed on balls in this cluster. |
| 12L | | 0 | | | | | | | | | | No plugs have been placed on balls in this cluster. |
| **85 - Total number of live coral plugs** | | | | | | | | | | | | |

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

**SPECIES OF CORALS ON CORAL PLUGS**

| Coral Species | Number of Live Plugs | | % of Total |
|---|---|---|---|
| Brain coral | | 8 | 9,41 |
| Finger coral | | 6 | 7,06 |
| Flower coral | | 4 | 4,71 |
| Leaf coral | | 18 | 21,18 |
| Maze coral | | 3 | 3,53 |
| Mustard hill coral | | 7 | 8,24 |
| Pencil coral | | 1 | 1,18 |
| Staghorn coral | | 9 | 10,59 |
| Star coral | | 1 | 1,18 |
| Starlet coral | | 1 | 1,18 |
| Sea rods black | 13 | | |
| Sea rods purple | 6 | 27 | 31,76 |
| Sea rods white | 8 | | |
| **TOTAL** | | **85** | **100** |



**PORTOMAREA MARINE MONITORING**
**SURVIVAL COMPARISON**
**July 2001/January 2002**

| **July 2001 Monitoring** (per M.Kuenen) | | | | **January 2002 Monitoring** | |
|---|---|---|---|---|---|
| **Coral Species** | **Orig.# of Plugs** | **Number of Live Plugs** | **Mortality 90 days** | **Number of Live Plugs** | **Mortality 9 months** |
| Brain coral* | 8 | 8 | 0% | 8 | 0% |
| Finger coral | 29 | 16 | 45% | 6 | 79% |
| Flower coral | 8 | 7 | 13% | 4 | 50% |
| Leaf coral | 25 | 25 | 0% | 18 | 28% |
| Maze coral | 6 | 5 | 17% | 3 | 50% |
| Mustard hill coral* | 7 | 7 | 0% | 7 | 0% |
| Pencil coral | 15 | 7 | 53% | 1 | 93% |
| Staghorn coral | 28 | 11 | 61% | 9 | 68% |
| Star coral | 3 | 3 | 0% | 1 | 67% |
| Blushing star coral | 1 | 1 | 0% | 0 | 100% |
| Starlet coral | 2 | 2 | 0% | 1 | 50% |
| Sea rods black | 15 | 13 | 13% | 13 | 13% |
| Sea rods purple | 6 | 6 | 0% | 6 | 0% |
| Sea rods white | 11 | 10 | 9% | 8 | 27% |
| | | | Mean | | Mean |
| **TOTALS** | **164** | **121** | **26%** | **85** | **48%** |

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

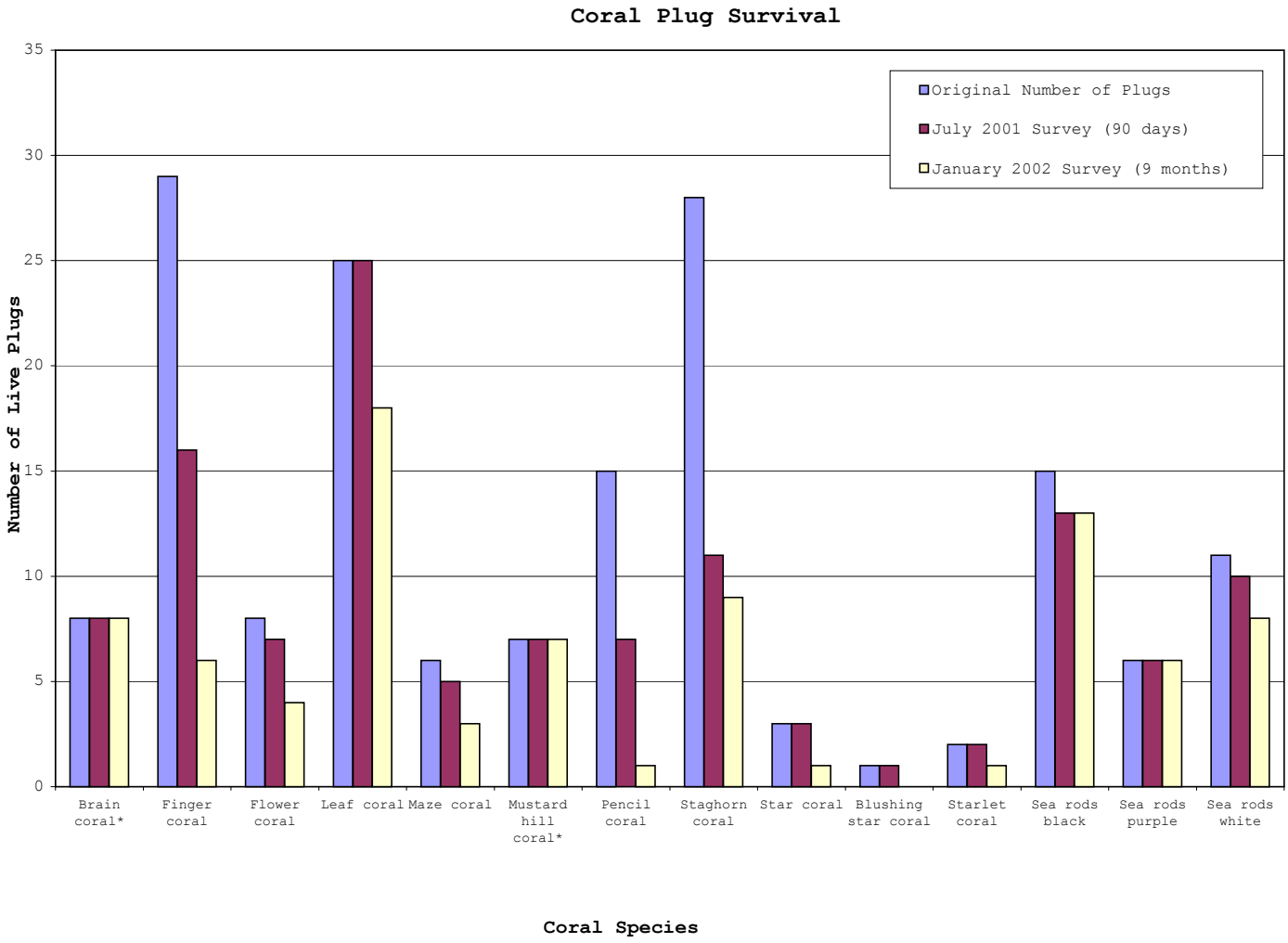



chart plug survival comparison
MAK

# PORTOMAREA MARINE MONITTORING

## REEF BALL CLUSTERS

## FISH AND INVERTEBRATE SUMMARY

| Cluster No. | No.of Fish | % of Total | No.of Invertebrates | % of Total |
|---|---|---|---|---|
| 1R | 71 | 4,45 | 0 | 0,00 |
| 2R | 55 | 3,45 | 0 | 0,00 |
| 3R | 200 | 12,54 | 5 | 5,68 |
| 4R | 96 | 6,02 | 1 | 1,14 |
| 5R | 73 | 4,58 | 11 | 12,50 |
| 6R | 43 | 2,70 | 8 | 9,09 |
| 7R | 44 | 2,76 | 1 | 1,14 |
| 8R | 80 | 5,02 | 10 | 11,36 |
| 9R | 45 | 2,82 | 6 | 6,82 |
| 10R | 80 | 5,02 | 13 | 14,77 |
| 1L | 12 | 0,75 | 2 | 2,27 |
| 2L | 35 | 2,19 | 0 | 0,00 |
| 3L | 28 | 1,76 | 0 | 0,00 |
| 4L | 48 | 3,01 | 1 | 1,14 |
| 5L | 35 | 2,19 | 0 | 0,00 |
| 6L | 129 | 8,09 | 1 | 1,14 |
| 7L | 133 | 8,34 | 0 | 0,00 |
| 8L | 151 | 9,47 | 29 | 32,95 |
| 9L | 67 | 4,20 | 0 | 0,00 |
| 10L | 41 | 2,57 | 0 | 0,00 |
| 11L | 69 | 4,33 | 0 | 0,00 |
| 12L | 60 | 3,76 | 0 | 0,00 |
| **TOTAL** | **1595** | **100** | **88** | **100,00** |

# PORTOMAREA MARINE MONITORING

## FISH AND INVERTEBRATE SUMMARY CHART

### REEF BALL CLUSTERS

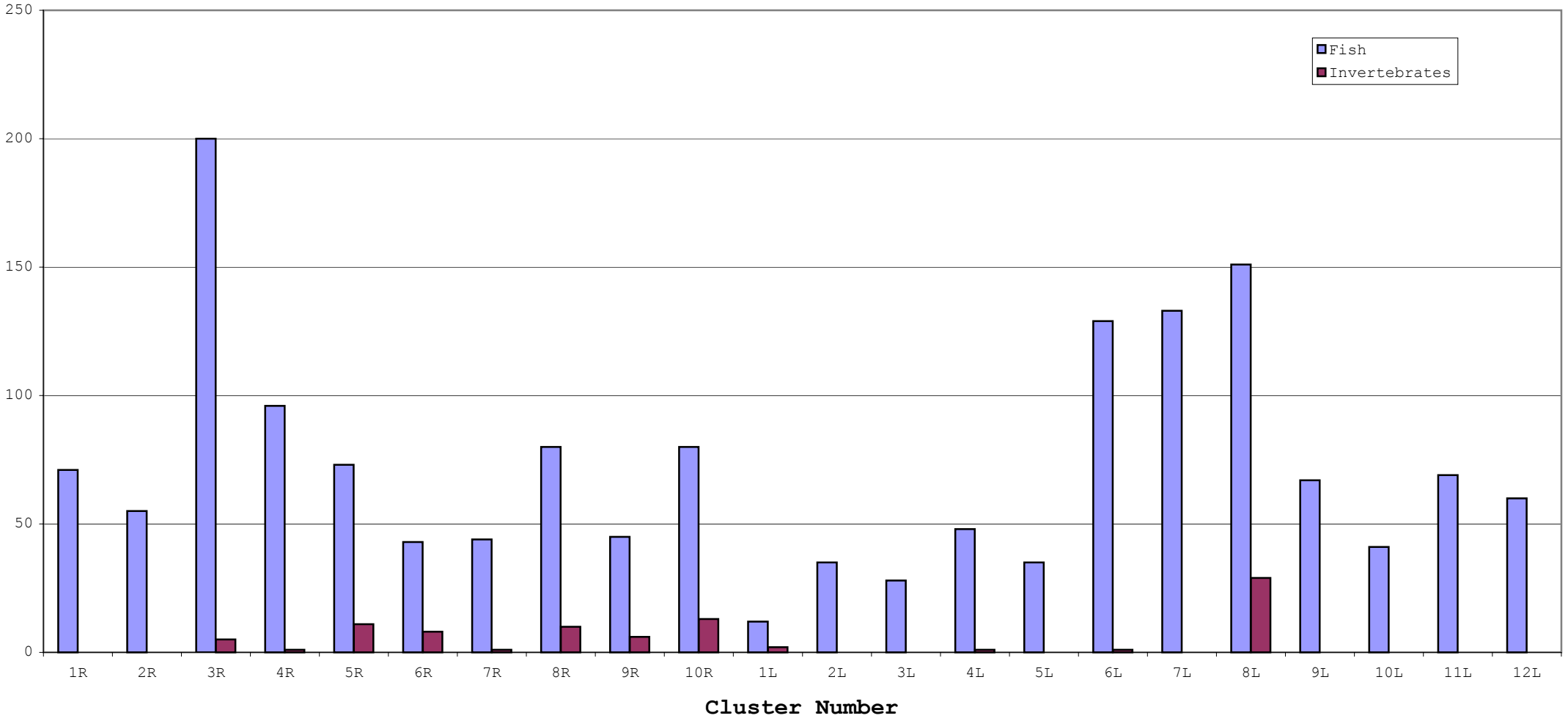



Chart reef balls fish survey summary
MAK

## PORTOMAREA MARINE MONITORING

### FISH and INVERTEBRATE SURVEY - REEF BALL CLUSTERS WEST

DATE: January 8 & 9, 2002
TIME: 9:00 a.m.
Data collected by: Marjo van den Bulck, Maryke Kolenousky

| CLUSTER NUMBER | | 1R | 2R | 3R | 4R | 5R | 6R | 7R | 8R | 9R | 10R | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH | | 1.2m | 1.4m | 1.2m | 1.6m | 1.8m | 2.7m | 2.9m | 3.6m | 3.8m | 3.8m | | | |
| | FISH | | | | | | | | | | | Total | Mean | St.Dev. |
| ANGELFISH | French Angelfish | | 1 | | 2 | | | | | | 1 | 4 | 0,40 | 0,70 |
| BASSLET | Fairy Basslet | | | 3 | 2 | 3 | 2 | 1 | | 2 | | 13 | 1,30 | 1,25 |
| BLENNY | Redlip Blenny | | | 1 | | | | | | | | 1 | 0,10 | 0,32 |
| BOXFISH | Smooth Trunkfish | | | | | 1 | 1 | | | | | 2 | 0,20 | 0,42 |
| | Spotted Trunkfish | | | | | 1 | | 1 | | | 1 | 3 | 0,30 | 0,48 |
| BUTTERFLYFISH | Banded Butterflyfish | | | | | | | | | | 2 | 2 | 0,20 | 0,63 |
| | Foureye Butterflyfish | | | | | | | | | 1 | 2 | 3 | 0,30 | 0,67 |
| CHROMIS | Blue Chromis | | | | | | | | | | 4 | 4 | 0,40 | 1,26 |
| | Brown Chromis | 5 | | 25 | | | | | 50 | | | 80 | 8,00 | 16,70 |
| DAMSELFISH | Beaugregory | | | 1 | | | | | | | | 1 | 0,10 | 0,32 |
| | Bicolor Damselfish | 2 | 3 | 25 | 25 | 3 | 4 | | 1 | 11 | 6 | 80 | 8,00 | 9,46 |
| | Dusky Damselfish | 3 | 1 | | | 4 | 4 | 1 | | 2 | 11 | 26 | 2,60 | 3,34 |
| | Sergeant Major | 20 | 10 | 3 | 4 | 5 | 3 | 10 | 5 | 6 | 5 | 71 | 7,10 | 5,17 |
| | Threespot Damselfish | | | | 2 | 2 | 1 | 1 | | 1 | 2 | 9 | 0,90 | 0,88 |
| | Yellowtail Damselfish | | | | 1 | | 1 | 1 | | | 1 | 4 | 0,40 | 0,52 |
| DRUM | Spotted Drum | | | | | | | | | | 1 | 1 | 0,10 | 0,32 |
| FILEFISH | Orangespotted Filefish | 1 | | | | | | | | | | 1 | 0,10 | 0,32 |
| FLOUNDER | | | | | | | | | | | | | | |
| GOATFISH | Spotted Goatfish | | | | 1 | | | 1 | 1 | | | 3 | 0,30 | 0,48 |
| | Yellow Goatfish | | 1 | 2 | 1 | | 1 | 6 | | | 2 | 13 | 1,30 | 1,83 |
| | Bridled Goby | 5 | | 5 | 3 | 4 | 3 | | 3 | 3 | | 26 | 2,60 | 1,96 |
| GOBY | Goby Sharknose | | | | | | | | | | 2 | 2 | 0,20 | 0,63 |
| GROUPER | Graysby | | | | | 1 | | | | | | 1 | 0,10 | 0,32 |
| | Red Hind | | | | | | | 1 | 1 | | 1 | 3 | 0,30 | 0,48 |
| GRUNT | Bluestriped Grunt | | | | 2 | | 1 | 3 | | | 1 | 7 | 0,70 | 1,06 |
| | French Grunt | 1 | | 100 | | 4 | 2 | 2 | 1 | | | 110 | 11,00 | 31,30 |
| HAMLET | Blue Hamlet | | | | | 2 | | | | | | 2 | 0,20 | 0,63 |
| | Butter Hamlet | | | | | | | | | 1 | | 1 | 0,10 | 0,32 |
| JACK | Bar Jack | | | | | 1 | | | | | | 1 | 0,10 | 0,32 |
| PARROTFISH | Princess Parrotfish | 4 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 5 | 27 | 2,70 | 1,25 |
| | Queen Parrotfish | | 2 | 1 | 4 | 6 | 5 | 3 | 2 | 1 | 1 | 25 | 2,50 | 1,96 |
| | Redband Parrotfish | | | | | | | | | | 1 | 1 | 0,10 | 0,32 |
| | Stoplight Parrotfish | | | | | | 2 | 1 | | | 4 | 7 | 0,70 | 1,34 |
| PUFFER | Balloonfish | | | | | 1 | 1 | | | | | 2 | 0,20 | 0,42 |
| | Sharpnose Puffer | | | | | | 1 | | 1 | 2 | 2 | 6 | 0,60 | 0,84 |
| SCORPIONFISH | Reef Scorpionfish | | | 1 | | 1 | | | | | | 2 | 0,20 | 0,42 |
| SEABASS | | | | | | | | | | | | | | |
| SNAPPER | Mahogany Snapper | | | | | | | 1 | | | | 1 | 0,10 | 0,32 |
| | Schoolmaster | | | | | | | 1 | | 1 | 7 | 9 | 0,90 | 2,18 |
| SQUIRRELFISH | Blackbar Soldierfish | | | | | | 2 | | | 2 | 4 | 8 | 0,80 | 1,40 |
| | Squirrelfish | | | | | | 1 | | | | | 1 | 0,10 | 0,32 |
| SURGEONFISH | Blue Tang | 1 | 5 | 3 | 2 | 3 | | 1 | 1 | 3 | 1 | 20 | 2,00 | 1,49 |
| | Doctorfish | | | | | | | | 1 | 1 | 3 | 5 | 0,50 | 0,97 |
| WRASSE | Bluehead Wrasse | 15 | 10 | 8 | 25 | 7 | | 3 | 4 | 2 | 5 | 79 | 7,90 | 7,40 |
| | Puddingwife | | | 2 | 2 | 2 | | 1 | | 2 | | 9 | 0,90 | 0,99 |
| | Rainbow Wrasse | | | | | 5 | | | | | | 5 | 0,50 | 1,58 |
| | Slippery Dick | 14 | 20 | 15 | 15 | 9 | 2 | | 2 | | | 77 | 7,70 | 7,76 |
| | Yellowhead Wrasse | | | | | 2 | 3 | | 4 | 2 | 2 | 13 | 1,30 | 1,49 |
| OTHERS | Lizardfish, Bluestriped | | | | | | | 1 | | 1 | | 2 | 0,20 | 0,42 |
| | Mojarra, Yellowfin | | | | 3 | 1 | | | | | | 4 | 0,40 | 0,97 |
| | Soapfish, Greater | | | | | 2 | | | 2 | | 2 | 6 | 0,40 | 0,97 |
| | Trumpetfish | | | 2 | | | | 1 | | | 1 | 4 | 0,40 | 0,70 |
| TOTAL | | 71 | 55 | 200 | 96 | 73 | 43 | 44 | 80 | 45 | 80 | 787 | 78,7 | |

| | INVERTEBRATES | | | | | | | | | | | Total | Mean | St.Dev. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| ANEMONE | Beaded Anemone | | | | | | 2 | | | | | 2 | 0,20 | 0,63 |
| | Corkscrew Anemone | | | | | 3 | 2 | | 4 | 1 | 4 | 14 | 1,40 | 1,71 |
| | Giant Anemone | | | | | 4 | 3 | 1 | | 1 | 3 | 12 | 1,20 | 1,55 |
| CRUSTACEANS | Pedersen Cleaner Shrimp | | | | | | | | 3 | 1 | | 4 | 0,40 | 0,97 |
| | Nimble Spray Crab | | | 5 | | | 1 | | 1 | | | 7 | 0,70 | 1,57 |
| | Yellowline Arrow Crab | | | | | | | | 1 | | | 1 | 0,10 | 0,32 |
| TUBE WORMS | Split Crown Feather Duster | | | | | 1 | | | | 2 | 5 | 8 | 0,80 | 1,62 |
| | Christmas Tree Worm | | | | | | | | | 1 | | 1 | 0,10 | 0,32 |
| MOLLUSKS | Atlantic Pearl Oyster | | | | | | | | 1 | | | 1 | 0,10 | 0,32 |
| | Queen Conch (12cm long) | | | | | | | | | | 1 | 1 | 0,10 | 0,32 |
| ECHINODERMS | Longspined Sea Urchin | | | | 1 | 3 | | | | | | 4 | 0,40 | 0,97 |
| | Sea Cucumber Three-Rowed | | | | | | | 1 | | | | 1 | 0,10 | 0,32 |
| TOTAL | | | | 5 | 1 | 11 | 8 | 1 | 10 | 6 | 13 | 55 | 5,5 | |

Comments:
Sergeant Majors have deposited eggs in reef balls.
Significant number of juvenile fish, e.g. damsels, grunts, wrasses, using rubble in reef balls for shelter.

## PORTOMAREA MARINE MONITORING

### FISH and INVERTEBRATE SURVEY - REEF BALL CLUSTERS EAST

DATE: January 10, 2002
TIME: 9:30a.m.
Data collected by: Marjo van den Bulck, Maryke Kolenousky

| CLUSTER NUMBER | | 1L | 2L | 3L | 4L | 5L | 6L | 7L | 8L | 9L | 10L | 11L | 12L | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | | | St. |
| | FISH | | | | | | | | | | | | | Total | Mean | Dev. |
| ANGELFISH | French Angelfish | | | | | | 1 | | | | | | | 1 | 0,08 | 0,29 |
| BLENNY | Redlip Blenny | | | | 1 | | | | | | | | | 1 | 0,08 | 0,29 |
| BOXFISH | Smooth Trunkfish | | | | | | | | | | 1 | | 2 | 3 | 0,25 | 0,62 |
| | Spotted Trunkfish | | | | | | | | | | 1 | 1 | | 2 | 0,17 | 0,39 |
| BUTTERFLYFISH | Banded Butterflyfish | | | | | | | | | 1 | | | | 1 | 0,08 | 0,29 |
| | Foureye Butterflyfish | | | | | | | | | | | 2 | | 2 | 0,17 | 0,58 |
| CHROMIS | Brown Chromis | | | 1 | | | | 1 | 40 | | | | | 42 | 3,50 | 11,50 |
| DAMSELFISH | Beaugregory | | 1 | 3 | | | | | | | | | | 4 | 0,33 | 0,89 |
| | Bicolor Damselfish | | | | 15 | | 25 | 10 | | | 2 | 3 | 6 | 61 | 5,08 | 7,91 |
| | Cocoa Damselfish | 3 | 2 | 3 | 5 | 2 | 1 | 3 | | | | | | 19 | 1,58 | 1,68 |
| | Dusky Damselfish | 1 | | | | | 1 | | 5 | | | | | 7 | 0,58 | 1,44 |
| | Sergeant Major | 2 | 1 | | | | 3 | 5 | 20 | 12 | 5 | 4 | 20 | 72 | 6,00 | 7,34 |
| | Threespot Damselfish | | | | 1 | | | | | | | | | 1 | 0,08 | 0,29 |
| | Yellowtail Damselfish | | 1 | | 1 | | | | | | | | | 2 | 0,17 | 0,39 |
| DRUM | | | | | | | | | | | | | | | | |
| FILEFISH | Orangespotted Filefish | | | | | | 1 | 1 | 1 | | | | | 3 | 0,25 | 0,45 |
| FLOUNDER | Peacock Flounder | | | 2 | | | | | | | | | | 2 | 0,17 | 0,58 |
| GOATFISH | Spotted Goatfish | | | | | | | | | | 1 | | 2 | 3 | 0,25 | 0,62 |
| | Yellow Goatfish | | | | 1 | | 3 | 2 | | 4 | | 3 | 2 | 15 | 1,25 | 1,48 |
| GOBY | Bridled Goby | | 2 | 1 | | 4 | | | | | 7 | 10 | 11 | 35 | 2,92 | 4,14 |
| GROUPER | Coney | | | | | | 1 | 1 | | | | | | 2 | 0,17 | 0,39 |
| | Graysby | | | 1 | 2 | | | | | | | | | 3 | 0,25 | 0,62 |
| | Red Hind | | | | | | 1 | | 1 | | | | | 2 | 0,17 | 0,39 |
| GRUNT | Bluestriped Grunt | | | | | | 1 | 1 | 1 | | | | | 3 | 0,25 | 0,45 |
| | French Grunt | | | | 2 | 1 | | 5 | 75 | 2 | | | | 85 | 7,08 | 21,44 |
| HAMLET | | | | | | | | | | | | | | | | |
| JACK | | | | | | | | | | | | | | | | |
| PARROTFISH | Princess Parrotfish | | | | 1 | | 2 | 2 | | | | 3 | 3 | 11 | 0,92 | 1,24 |
| | Queen Parrotfish | | | | 1 | | 3 | 2 | 1 | | 1 | | 1 | 9 | 0,75 | 0,97 |
| | Stoplight Parrotfish | | | | 2 | | 2 | 1 | 3 | | | | | 8 | 0,67 | 1,07 |
| | Reef Scorpionfish | | | 1 | | | | | | | | | | 1 | 0,08 | 0,29 |
| PUFFER | | | | | | | | | | | | | | | | |
| SEABASS | Harlequin Bass | | | | | | 1 | 2 | | | | | | 3 | 0,25 | 0,62 |
| | Tobaccofish | | | | 1 | | | 1 | | | | | | 2 | 0,17 | 0,39 |
| SCORPIONFISH | | | | | | | | | | | | | | | | |
| SNAPPER | | | | | | | | | | | | | | | | |
| SQUIRRELFISH | Squirrelfish | | | | | | | 1 | 1 | | | | | 2 | 0,17 | 0,39 |
| SURGEONFISH | Blue Tang | 1 | | 1 | 1 | | 2 | | | | 5 | 4 | 3 | 17 | 1,42 | 1,73 |
| | Doctorfish | | | 1 | 3 | 5 | 3 | 4 | | 6 | | 7 | 2 | 31 | 2,58 | 2,50 |
| | Ocean Surgeonfish | 1 | | | 1 | 1 | | 1 | | | 2 | | 1 | 7 | 0,58 | 0,67 |
| WRASSE | Bluehead Wrasse | | 5 | 6 | 5 | 15 | 75 | 75 | 3 | 35 | 8 | 7 | 1 | 235 | 0,08 | 27,48 |
| | Clown Wrasse | | | | 1 | | | | | | | | | 1 | 19,58 | 0,29 |
| | Puddingwife | | | | 1 | 2 | 3 | | | | | | | 6 | 0,50 | 1,00 |
| | Slippery Dick | 3 | 23 | 8 | 3 | 5 | | 15 | | 7 | 8 | 25 | 5 | 102 | 8,50 | 8,30 |
| | Yellowhead Wrasse | | | | | | | | | | | | 1 | 1 | 0,08 | 0,29 |
| OTHERS | Mojarra, Yellowfin | 1 | | | | | | | | | | | | 1 | 0,08 | 0,29 |
| TOTAL | | 12 | 35 | 28 | 48 | 35 | 129 | 133 | 151 | 67 | 41 | 69 | 60 | 808 | 67,33 | |
| | INVERTEBRATES | | | | | | | | | | | | | Total | Mean | St. Dev. |
| ANEMONE | Corkscrew Anemone | | | | 1 | | | | | | | | | 1 | 0,1 | 0,29 |
| CRUSTACEANS | Nimble Spray Crab | 1 | | | | | 1 | | 2 | | | | | 4 | 0,3 | 0,65 |
| | Eroded Mud Crab | 1 | | | | | | | | | | | | 1 | 0,1 | 0,29 |
| TUBE WORMS | Split Crown Fthr.Duster | | | | | | | | 2 | | | | | 2 | 0,2 | 0,58 |
| MOLLUSKS | | | | | | | | | | | | | | | | |
| ECHINODERMS | Longspined Sea Urchin | | | | 3 | | 3 | | 25 | | | | | 31 | 2,6 | 7,15 |
| TOTAL | | 2 | | | 1 | | 1 | | 29 | | | | | 33 | 2,75 | |

Comments: Left side Reef Balls were recently placed (Dec.2001), and have no rubble in them yet. With the exception of wrasses, there were few juvenile fish using these reef balls for shelter. The absence of rubble is also most likely why there are few invertebrates in these balls. The exception is the high number of urchins on Cluster 7L, which were manually placed there.