

**Report on observations of coral bleaching**  
**St Eustatius Marine Park, Saba Marine Park, St Maarten Marine Park**  
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10 October 2005

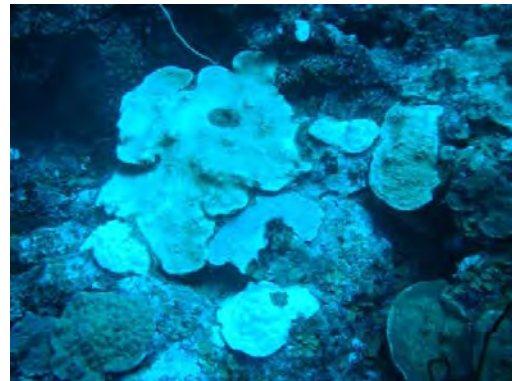
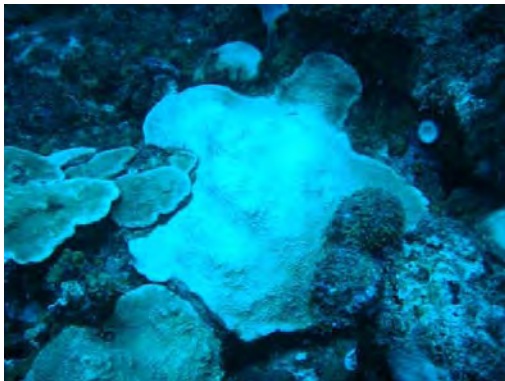
Coral bleaching has been observed in the Windward Islands since late August 2005. Reports and observations have been received from marine parks and dive operators in Saba, St Maarten, St Eustatius, St Kitts and Nevis. Marine Parks have been vigilant to reports of bleaching following the April 2005 warning of warmer sea surface temperatures in the Caribbean due to a change in the normal upwelling patterns, which was circulated by Paul Hoetjes (Department of Environment and Nature, Ministry of Public Health and Social Development of the Netherlands Antilles). This report has combined observations from three marine parks (Saba, St Eustatius, St Maarten).

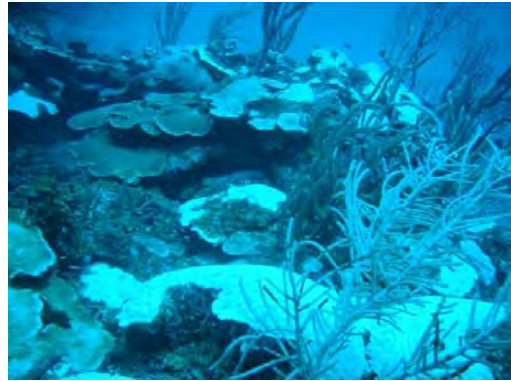
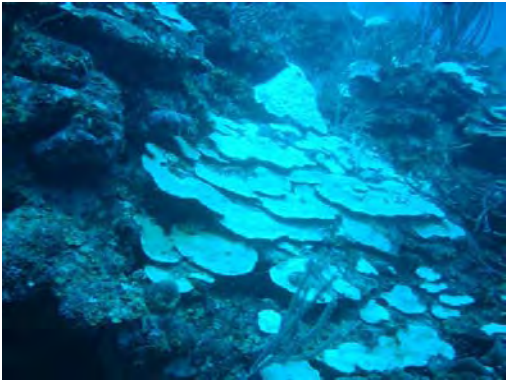
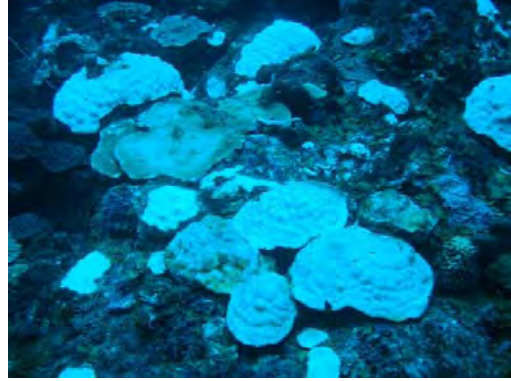
**St Eustatius**

The first observation by a dive centre of bleached corals was on 24<sup>th</sup> August at Cliffs dive site at a depth of 29m. A visit by the marine park found that there were no bleached corals above the depth of 26m. Between 26-44m depth (and beyond), only plate coral forms were bleached. All other coral colony forms were unaffected. There was a noticeable thermocline at 25m.

The bleaching affected shallower corals from 12<sup>th</sup> September when dive centres reported corals bleached at 16m. By the 16<sup>th</sup> September, the marine park observed bleached corals on the old city wall (3m depth). By this time, corals of all morphologies were affected. A dive to the deepest site of the wall (Drop Off West) on 7<sup>th</sup> October found that all coral colonies were affected by bleaching, some more than others with no apparent pattern. It was estimated that approximately 70-80% of all hard corals observed during the 30 minute dive along the wall were bleached, including fire coral.

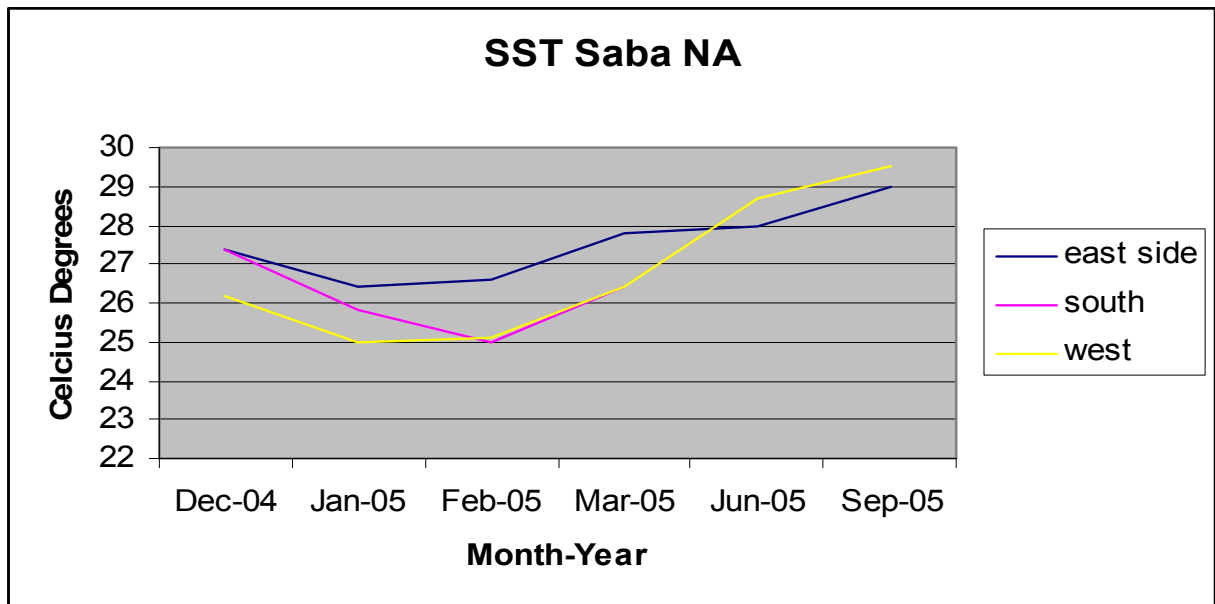
The marine park does not monitor temperatures with an accurate instrument. Dive computers recorded 82°F (27.8°C) in mid September and 81°F (27.2°C) on 9<sup>th</sup> October after 46.8mm rainfall on the 8-9<sup>th</sup> October. It is hoped that the unsettled weather will continue with rainfall that accelerates the water temperature drop. The following photos show coral colonies at 28-30m at Drop Off West site on 7<sup>th</sup> October.





## Saba

### Water temperature (since December 2004)



Although not complete, the above graph shows that lowest SST in 2005 was measured in January. The graph also gives an indication that SST can be expected to drop in November/December.

## Bleaching Log Book

### 22 September 2005

We noticed intensive bleaching of corals in Saba, at 25m and up. Dive operators commented that it got very noticeable since a week, but bleaching of corals started somewhere in August. They also mentioned that bleaching at greater depth is not so severe (pinnacles > 25m). Since 1997 I have not seen bleaching this severe, and I can not find a record of bleaching in Saba of this intensity.

Dive operators have been asked to accumulate as much information as possible (text, photos, video) and send it to the Saba Conservation Foundation. This event is unique, and the more information is collected the better. I haven't thought in too much detail about a proper protocol to objectively log the event, but we went out last week (3 November) to do four 20m transects and record according to ReefCheck protocol. We plan to visit the site every week, to get an idea of the bleaching progress.

Estimation is that 80% of all colonies of *M. cavernosa*, brain corals, surfaces are >90% bleached. Less bleached are the lettuce coral (50% of all colonies). Also *Millipora* sp. are bleached and lost stinging capability. Several barrel sponges (*Xestospegia mutans*) were bleached at base, and anemones were extremely bright in colour.

## 24 October 2005

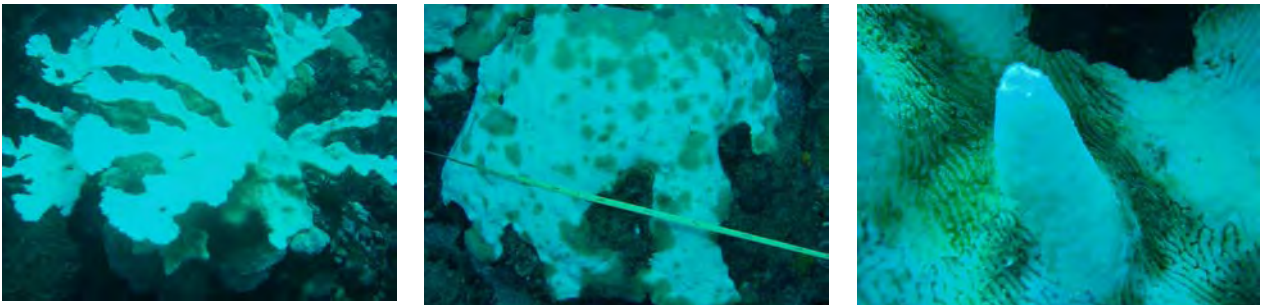
Some recent mortality of pillar corals *Dendrogyra cylindrus* and fresh algae overgrowth at base was noticed. Although at north of the island (Green Island), *Acropora* spp was still relatively unaffected by bleaching, the east side (Core Gut) both Elk,- and Stag horn was partially or completely bleached.



I have many more pictures but for e-mail sake, I kept it limited to three. Ours are similar to Statia anyhow.

## 3 November 2005

For the duration of this event, we have set up a transect at Core Gut (east side). Four 20 m transects were logged according to ReefCheck protocol.



*Elkhorn*

*Star*

*Pillar*

The results: of the total of hard corals in the transects, 80% was bleached and of those the area of bleaching was 67%. Two weeks later recovery was significant as well as some mortality.



## St Maarten

Ocean Care first noticed bleaching on August 17, at a depth of 15 m (Maze). Corals affected were mostly fire coral (70% of the fire coral was bleached). Water temperature was measured with a dive computer and showed 30° C.

Dive operators also recorded bleaching at various other sites. Surface water temperature on St Maarten has been much higher than usual this year, with an average of 26.2° C in January, rising to 27° C in March, and peaking mid-August until mid-October, when we measured 30° C.

During Reef Check monitoring on September 3 at Procelyte Reef we found that around 60% of all hard corals had been affected at a depth of 14.2 meters (see photo's).



September 30 measured 30 ° C at Divi Little Bay and showed most corals were severely affected (at least 75%) at 6.5 meters, including branching, mound and brain corals, as well as various soft corals (see photos).



On October 14 a peak temperature of 31° C was measured. After this, temperature has been going down steadily to an average of 28° C. The bleaching was further monitored at Maze I on October 30 along a 100-meter Reef Check transect using the Coral Watch Coral Health Chart, showing that all corals were affected, with 80% having unhealthy, bleached colours (40% score 1; 40% score 2 on the Coral Health Chart).

On November 20 at Coralita we saw some of the colors returning to various types of corals (see photos)



However, there is algae overgrowth and around 30% of the smaller colonies seem to have died.

We hope to continue to monitor the coral's recovery using the Coral Health Charts.