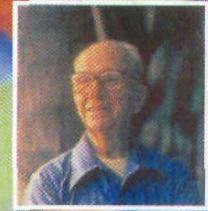


D-ECO



the ECO MAGAZINE of DOMINICA-NATURE ISLE #3



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GLOBAL WARMING

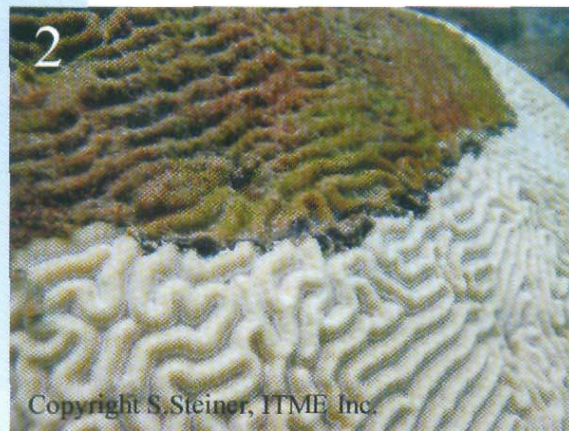
How does it affect Dominica's coral reefs?

Rising sea surface temperatures are among the many consequences of global warming which has increased dramatically over the past 100 years. This gradual warming of the marine environments represents a negative effect for reef corals which thrive in temperatures between 20 and 28 degrees Celsius. When temperatures exceed minimum of 1° C above the mean high temperature of a particular region, for 3-4 weeks, "coral bleaching" is a common occurrence. Bleaching is the consequence of corals losing endosymbiotic single-celled algae. These algae give corals their coloration and in their absence corals appear pale or white, an effect of the white coral skeleton becoming visible through the translucent coral tissues. Corals rely on these algae in many ways, including for their nutrition and skeletal growth. Consequently, the loss of endosymbiotic algae is a catastrophic event for corals which puts them in a weakened state, reduces their reproductive capabilities and makes them highly susceptible to diseases and death through other stresses such as sedimentation or eutrophication.

In Dominica, researchers at the Institute for Tropical Marine Ecology (ITME), have been monitoring reefs and recorded the effects of the bleaching events in 2003, 2004, 2005 and 2006. The year 2005 was the warmest year in the Caribbean on record. This was also the year with the severest effects of the

bleaching episode, affecting approximately 90% of the coral community.

Not all bleached corals necessarily die. It takes up 7 months or more for individual species and colonies to recover, if they do not succumb to other stresses first. Hence, the impact of a bleaching episode can only be detected months or a year after its onset. In



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2006 students and faculty at ITME revisited the reefs surveyed during the 2005 bleaching episode. Newly bleached corals were rare and 2006 was not marked by a bleaching episode. However, the survey revealed a stark difference in the coral community structure. Several coral species that were common or even abundant in 2005 had suffered a severe reduction in numbers and in some cases virtually disappeared from certain reef sites. A reduction of new coral recruits was also evident. The trends observed in Dominica were also seen by other researchers in Martinique and Barbados. Corals that did survive

regained their coloration and for the untrained visitor it may seem as though things are back to normal, but they are not. In fact, the reef resources have shrunk and lost some of their diversity. Alarming, in this whole story, is that we must expect bleaching episodes to become common chronic occurrence, rather than a sporadic one, given the current state of affairs with regards to global warming.

What does this mean for Dominica's reefs? It means that the immediate and successful management of local factors of reef degradation (e.g. sedimentation, pollution, overfishing) possibly represent the last chance to conserve Dominica's remaining reef resources. Local sources of degradation can be managed locally with local knowledge and expertise. Without such measures, global disturbances such as global warming may push the local resources beyond the threshold where recovery is possible.

Institute for Tropical Marine Ecology

Figure 1. Coral *M. faveolata* with bleached tissues.

Figure 2. Coral *D. strigosa* with algal overgrowth (top left) outlined by Black Band Disease (a consortium of cyanobacteria), and suffering from bleaching (bottom right).



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