

St. Maarten: Post Hurricane Coral Assessment

The St. Maarten Nature Foundation scientifically researched the impacts of Hurricane Irma on St. Maarten coral reefs using Global Coral Reef Monitoring Guidelines. They found that the general coral cover is reduced, but the Man of War Shoal Marine Protected Area showed greater resilience than reefs outside of the protected area.

Reef monitoring data has been scientifically analysed to assess the impacts of hurricanes Irma and Maria on St. Maarten's coral reefs following the Global Coral Reef Monitoring Network (GCRMN) guidelines. The hurricanes caused reduction in coral cover on St Maarten reefs; however reef health improved due to a decrease in coral bleaching.

Unfortunately, macro algae cover increased after the hurricanes. This high algae cover threatens coral recruitment and coral growth. Caribbean coral reefs have been deteriorated to a macro algal state due to several factors such as the die off or overfishing of herbivores (such as parrotfish), climate change, human and natural disasters. Three months after the hurricanes water quality was decreased on all our reefs, water visibility was reduced by about sixteen meters.

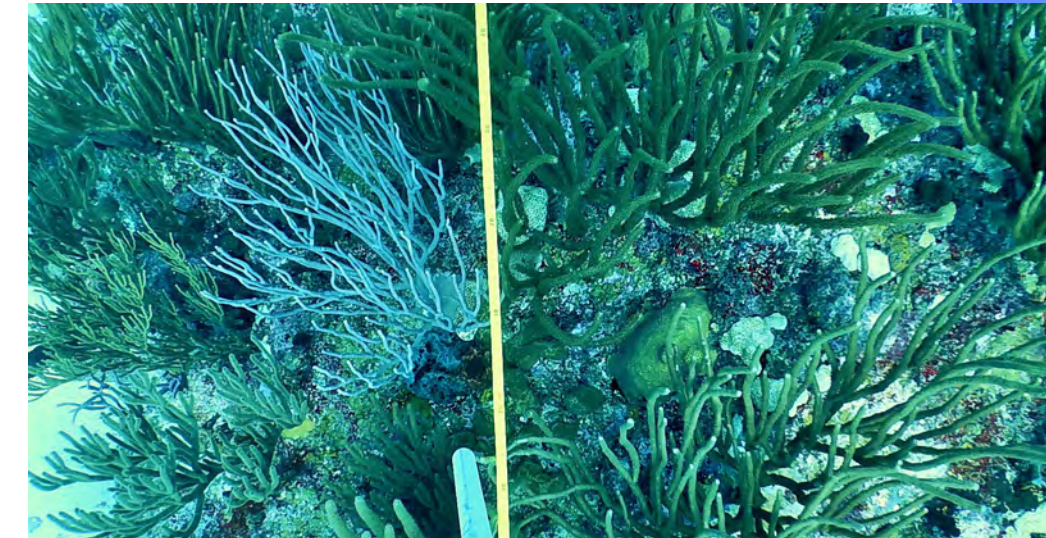
"Coral cover (hard corals) has been significantly reduced from 6.1 % to 3.7% since the passage of the hurricanes, which is unfortunate but expected considering the intensity of Irma. Coral cover is still higher than observed in 2016 (3.5%). Scientific research found that coral cover mostly declines the year after large hurricanes, therefore we are concerned to observe a larger reduction of coral cover for this year. The decrease in coral bleaching could be favourable for the health of our corals and is likely caused by the lower sea water temperatures and the decreased visibility after the storms. We are worried about the higher algae cover,

this could deteriorate our coral reefs even more" explained Nature Foundation's Projects Officer Melanie Meijer zu Schlochtern.

The strong surge and swells of the storms caused gorgonian corals (soft corals) and fleshy algae to be ripped off from our reefs, leading to more exposure of coral recruits, sponges and calcareous coralline algae (CCA). After the hurricanes higher carnivorous fish biomass was found on the reefs. This increase of larger fish, especially groupers and snappers, was found to be extraordinary high in the Marine Protect Area's mostly healthy reefs, such as Proselyte Reef and Mike's Maze. Herbivorous fish biomass did not change significantly after the hurricanes, however fewer fish species were found.

"More accessible CCA can be profitable as it is used by juvenile corals to settle on and these juveniles can grow into larger corals and build our next generation of coral reefs. Larger pelagic fish can travel long distances. They may look for the best shelter against the impacts of the hurricanes and therefore moved to the reefs with the highest coral cover to find their needs", stated Achsah Mitchell GCRMN data analyst.

The results of the St Maarten's reef monitoring also show the significance of protecting our reefs, as coral reefs in the Marine Protected Area performed better and are healthier, with higher coral, gorgonian coral, CCA and sponge cover compared to other St Maarten Reefs outside the protected area. Reefs outside of the Marine Protected Area had significantly more macro algae cover than reefs within the Park. Also, greater densities of coral recruits, which indicate a greater number of healthy and reproducing corals, were found. Moreover, carnivorous fish and herbivorous fish had a greater biomass within the Marine Protected Area.



Photos by: © St. Maarten Nature Foundation

"If we do not protect our coral reefs, health, fish biomass and coral cover will decrease and our reefs will shift to a macro algae state. Algae cover was the lowest inside the Marine Protected Area, showing us the effectiveness of protecting our coral reefs. Our results demonstrate clearly the importance of our Marine Protected Area 'Man of War Shoal' for our fish stocks and coral reef preservation" stated Nature Foundation's Projects Officer Melanie Meijer zu Schlochtern.

The entire country benefits from reefs with higher coral cover and lower macro algae, these reefs are also more resilient regarding disaster events, such as Hurricane Irma. *"The reefs in the Marine Protected Area showed greater resilience to hurricanes than reefs outside the protected area. Especially the lower macro algae cover makes reefs better suited for coral growth and recruitment and would therefore have a higher resilience for hurricanes and other threats. I recommend increasing coral reef protection, management and monitoring, especially within the Marine Protected Area"* explained Achsah Mitchell GCRMN data analyst.



Photo by: © St. Maarten Nature Foundation

Every year, the St Maarten Nature Foundation monitors St Maarten's coral reefs scientifically using the GCRMN method to determine the health, composition and state of St Maarten reefs. With financial support made available by DCNA the Foundation was also able to monitor and analyze the reefs after the hurricanes in 2017.

Several dive sites in the Man of War Shoal Marine Protected Area and other important dive sites around the island were monitored pre-hurricanes in Augustus and post-hurricanes in December 2017. All measurements were conducted along a transect line and repeated five times on each dive site. First, abundance and biomass of all fish species were determined, secondly the cover of reef organisms (corals) were analyzed based on photo quadrats made during the dives and photo quadrats were assessed for coral health. Monitoring is also done looking for coral recruitments (juvenile corals) and algae coverage and height. Lastly, invertebrate species were counted and water quality was measured. Results were assessed, scientifically analyzed and interpreted by GCRMN data analyst Achsah Mitchell; the full report can be found in the Dutch Caribbean Biodiversity Database (DCBD).

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