



Can This Software Save Our Reefs?

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Throughout the years the CNMI's coral reefs have undergone many changes. Whether for better or for worse our marine ecosystems are changing and it is important that we do our best to monitor these changes through data collection and analysis. Now, thanks to technological advances in graphic imaging and survey software, many scientists and resource managers are able to keep tabs on reef health in a variety of innovative ways. The CNMI's Long-term Marine Monitoring Team (CNMI MMT) from the Bureau of Environmental and Coastal Quality (BECQ) employs the use of such software. The Coral Point Count with Excel extensions program (CPCe) is a software that provides a tool to

then analyzed with the CPCe program and later transferred into an excel file, formally known as the benthic master database. In addition to gathering data and finding supporting factors in the ocean, there is the comparing of the same sites throughout the years. When looking through the benthic master database, information of the reefs and its conditions go back to the year 2002. This allows scientists and researchers to understand the changes that have occurred and take management actions if necessary.

Throughout my experience working with the CNMI MMT, I have definitely learned a lot about our ocean and life within. Prior to this internship I was unaware of the methods used to survey the marine environment and the various



programs used to process data. Using the CPCe program was a straightforward process and I had little to no problems with the software. It is without a doubt, a helpful program and provides local managers with a useful tool towards protecting the CNMI's reefs.

References:

Kohler, K.E. and S.M. Gill, 2006. Coral Point Count with Excel extensions (CPCe): A Visual Basic program for the determination of coral and substrate coverage using random point count methodology. *Computers and Geosciences*, Vol. 32, No. 9, pp. 1259-1269, DOI:10.1016/j.cageo.2005.11.009.

determine benthic substrate cover for established sites on Saipan, Tinian and Rota (Kohler et al. 2005). This software helps us to see whether our coral reefs are improving or declining in the face of both global and local stressors.

With this program, scientists are able to analyze digital data (photos) collected by field surveys to determine percent cover of corals, algae, and invertebrates in a quarter meter photo quadrat. The information gathered are from established sites throughout the island where 5x50 m transect lines are placed across the sea floor. At these sites, benthic cover photos are taken for every meter along the line. These photos are

CNMI Marine Monitoring Team: Doctors of the Reef!

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Our coral reefs have undergone many changes in the last couple of decades and are facing increased pressures from human impacts. These pressures include changes in water quality, fishing pressure, and ocean warming and acidification. The role of the CNMI Marine Monitoring Team (CNMI MMT) is to record changes in our coral reef ecosystems at different locations around the CNMI. With the information gathered by the CNMI MMT, we can monitor our reefs and ensure that they are healthy for present and future generations.

In order to identify changes in algae, coral, and fish abundance, the CNMI Marine Monitoring Team surveys long-term monitoring sites at Saipan, Tinian, and Rota. Locations where these surveys are conducted include construction sites, runoff discharge areas, and wastewater discharge areas. At these "Areas of Particular Concern" or APCs, the CNMI Marine Monitoring Team uses SCUBA gear to set up five transect lines at a depth of around 25 feet to conduct the survey. A transect line is a 50-meter rope on stainless steel and aluminum reel.

Typically, four divers with advanced SCUBA license or above are needed to conduct the surveys. At these sites, biologists record fish, coral, invertebrates, and algae population. Also, pictures are taken with underwater cameras for analysis of benthic cover, with up to 250 pictures for each site.

Once the biologists have completed gathering data, it is taken back to the office to be recorded. The pictures or photo quads taken are then uploaded to a software called Coral Point Count with Excel extensions or CPCe. This software allows us to identify coral, algae, sponges and invertebrates

in the photo quad. After each picture is correctly identified, the files are uploaded to a database that combines each transect line for that site. Current data collected is added to a database that contains all the data recorded from monitoring sites from previous years.

By gathering data from different sites around the CNMI, biologists are able to identify changes in CNMI's coral reef ecosystems. Depending whether said changes are beneficial or not, we can determine if precautions should be set up, such as marine protected areas or restoration projects. If action is taken, we can prevent our reefs from reaching a state where we can no longer save it from dying.

References:

Houk, P. and R. Van Woesik. 2006. Coral Reef Benthic Video Surveys Facilitate Long-Term Monitoring in the Commonwealth of the Northern Mariana Islands: Toward an Optimal Sampling Strategy. *Pacific Science*. 60(2): pg 179-189.

