Coral Bleaching Monitoring on Guam

In response to stresses such as higher water temperatures, corals can lose the symbiotic microscopic algae (which provides up to 95% of the coral's nutrition) from their tissues causing them to look white or "bleached". If favorable conditions return, corals can sometimes recover. However, bleached corals are more vulnerable to disease and other stressors, which can lead to death. This worldwide trend of coral bleaching is linked to global warming.

Coral reefs contain some of the most diverse ecosystems in the world and serve as critical habitats for thousands of species of marine organisms. Reefs support fisheries, protect coastlines from storms, and provide recreation. Coral bleaching resulting from higher sea surface temperatures threatens these resources. In 2013, an unprecedented coral bleaching event across Guam and the Marianas Archipelago was correlated with increased sea surface temperatures and reduced wind speeds for a four-month period. As a result, an astounding 85% of coral taxa showed signs of bleaching. This major event prompted the Guam Long-term Coral Reef Monitoring Program, NOAA, Guam EPA, the National Park Service, University of Guam, and Guam DAWR to work together to investigate the issue in an effort to promote coral reef resilience and recovery after such events.

Monitoring the coral reefs is a major activity of the National Park Service Inventory and Monitoring Program. National parks are partnering with research organizations like the University of Guam to study the impacts of bleaching on Guam's coral reefs.

Scientists from many stakeholder organizations began formal quantitative assessments of 3,600 photos from 48 reef sites on Guam.



University of Guam students photo surveying corals for signs of bleaching in War in the Pacific NHP

D. Burdick

They collect data on:

- The locations and depths of bleached corals
- The most vulnerable coral species
- The severity of the bleaching
- The size class of the corals which were bleaching
- Recovery of bleached colonies

These data will help us:

- To understand which corals may be resistant to coral bleaching
- To add to the understanding of which corals may be affected in future bleaching events
- To help resource managers both within and outside of park waters prepare for future bleaching events anticipated as a result of climate change

Preliminary results suggest:

- Recruitment of new corals is decreased during bleaching events
- Deeper coral colonies, even greater than 10 meters depth, can bleach when exposed to elevated sea surface temperatures
- Certain coral species are more susceptible to bleaching from extended elevated temperatures
- Different colonies of the same coral species can show different resistance to and recovery from bleaching