



National Wildlife Health Center  
Wildlife Health Bulletin 2012-06

## Cyanobacterial Disease Killing Coral on Kauai, Hawaii

**To: Natural Resource/Conservation Managers**  
**From: Dr. Jonathan Sleeman, Center Director, USGS National Wildlife Health Center**  
**Date: December 7, 2012**

An unusual coral mortality event on the north shore of the Hawaiian island of Kauai is currently being investigated. The [USGS National Wildlife Health Center Honolulu Field Station](#) (HFS) is collaborating with the [Hawaii Institute of Marine Biology](#) at the University of Hawaii in this coral disease investigation. Scientists have visited two different sites, which are near Hanalei Bay, multiple times to take samples and document extent of the damage. Samples from the lesions have been tested and scientists have determined that a cyanobacterial infection is associated with tissue loss and death. At both sites, coral reefs were heavily degraded with overgrowth of turf algae as well as sediment deposits. See photos at [Cyanobacterial Disease in \*Montipora\* Coral](#)

This coral disease outbreak is the first instance where cyanobacterial disease on a large scale has been documented in corals in Hawaii. Lesions are covering 10 – 80 percent of affected colonies. The consistent presentation of gross and microscopic lesions and the absence of this disease in corals elsewhere in Hawaii indicate that this outbreak is an epizootic currently limited to the north shore of Kauai. The HFS has archived tissues of a similar disease in Hanalei Bay from 2009 indicating that cyanobacterial disease in corals on north Kauai has been around since that time.

Histopathology of the lesion samples has revealed cyanobacterial infection and, to a lesser extent, fungi associated with cell death. Samples of cyanobacterial mats at edges of gross lesions have been sent to University of Hawaii for culture and identification; results are pending. Cyanobacteria are also commonly known as blue-green algae and are often associated with visible blooms in freshwater lakes; however, many cyanobacteria are also present in the ocean. Some species of cyanobacteria produce toxins that can sicken wildlife, domestic animals, and humans. The implications of this current outbreak are unknown.

Since 2001, HFS has been monitoring coral disease in Hawaii and U.S. Territories, Commonwealth, and Freely Associated States in the Pacific. A significant part of this effort is dedicated to applying standard biomedical tools used in wildlife disease investigations to corals in attempts to identify potential etiologic agents associated with coral mortality. While degradation of coral reefs is well documented in Hawaii, this is the first instance where a potential etiologic agent has been documented with a coral disease epizootic in the region.

This information raises numerous questions with potential answers that may have management implications. For example, what in north Kauai is causing epizootic cyanobacterial disease? Cyanobacterial blooms in estuarine ecosystems are usually driven by stagnant water and increased nutrients (nitrogen and phosphorus) and organic matter, so land-use patterns should be considered as a possible contributory factor. This epizootic cyanobacterial disease in coral is occurring in an area with relatively low population density. Addressing this complex problem will require collaborations from many organizations that may have an interest in conserving coral reef resources in Kauai and Hawaii overall. Understanding the drivers of this disease will be critical to preventing additional outbreaks and recovering these heavily degraded reefs.

If you see similar phenomena elsewhere in the Hawaiian Islands, please contact the USGS Honolulu Field Station at 808-792-9520 or [Eyes of the Reef](#) at 808-953-4044.

To report or request assistance for wildlife mortality events or health issues please visit NWHC at [http://www.nwhc.usgs.gov/mortality\\_events/reporting.jsp](http://www.nwhc.usgs.gov/mortality_events/reporting.jsp) or contact Dr. Anne Ballmann, 608-270-2445,

[aballmann@usgs.gov](mailto:aballmann@usgs.gov); Dr. LeAnn White, 608-270-2491, [clwhite@usgs.gov](mailto:clwhite@usgs.gov); Barb Bodenstein, 608-270-2447, [bbodenstein@usgs.gov](mailto:bbodenstein@usgs.gov); Dr. Thierry Work, 808-792-9520, [thierry\\_work@usgs.gov](mailto:thierry_work@usgs.gov) (Hawaii and Pacific Islands); or Jennifer Bradsby, 608-270-2443, [jbradsby@usgs.gov](mailto:jbradsby@usgs.gov) (single mortality events nationwide).

**Sources for more information:**

Work, T.M., Russell, Robin, & Aeby, G.S. (2012). Tissue loss (white syndrome) in the coral *Montipora capitata* is a dynamic disease with multiple host responses and potential causes. *Proceedings of the Royal Society B-Biological Sciences*, 279(1746), 4334-4341.

<http://rspb.royalsocietypublishing.org/content/279/1746/4334.long>

A HealthMap/ProMED-mail interactive map of the affected area can be accessed at <http://healthmap.org/r/4965>

To see past Wildlife Health Bulletins, click [here](#).

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