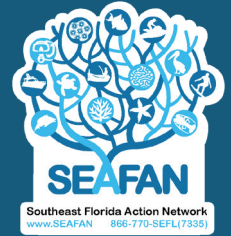




Florida Department of Environmental Protection Coral Reef Conservation Program

SEAFAN BleachWatch Program Coral Disease Fact Sheet

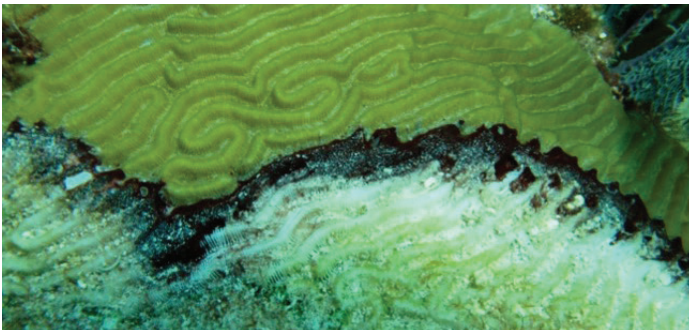


What is Coral Disease?

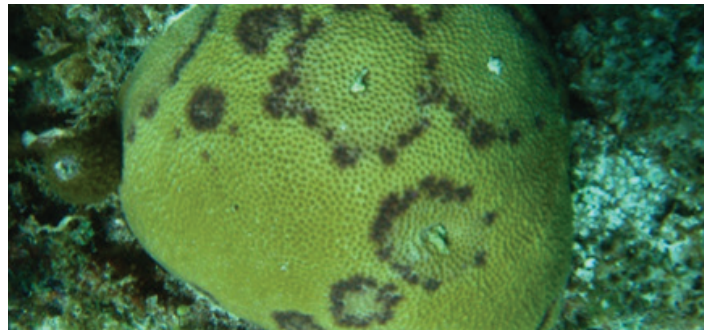
Coral reefs are ecologically and economically important ecosystems formed by stony corals, which are made up of multiple small, soft organisms known as polyps. Since corals are animals, they are susceptible to disease. Coral disease was first recognized in the Florida Keys and Caribbean in the 1970s, and since then, disease reports have emerged from reefs worldwide. While there are naturally occurring background levels of disease throughout ecosystems, over the past few decades, reports of disease outbreaks have increased in frequency and severity. Today, disease is recognized as a major contributor of coral mortality and reef degradation.

Coral disease can result from infection by microscopic organisms (such as bacteria or fungi) or abnormal growth (akin to tumors). The origins or causes of most coral diseases are difficult to determine. There is accumulating evidence that the increasing prevalence and severity of coral disease are due to environmental stressors, including increasing water temperatures, nutrients, sedimentation and marine debris.

Research studies have shown that the effects of coral bleaching and disease can be particularly devastating to coral populations. During coral bleaching events, the animal tissue expels symbiotic algae, resulting in the coral losing their primary energy source, weakening their ability to fight off or control disease agents.



Black band disease can be identified by a black line separating healthy coral tissue from a dead white or algal covered skeleton. The lethal thick microbial mat continues to spread across this colony of symmetrical brain coral (*Diploria strigosa*).
Photo by USGS Christina Kellogg.



Dark spot disease can be identified by multifocal lesions of round or irregular discolored spots. The spots are likely not lethal and may persist for years on this colony of massive starlet coral (*Siderastrea siderea*). Photo by FWC.

Identifying Coral Disease

Coral disease is often identifiable by changes in tissue color or skeletal structure as well as progressive tissue loss. Tissue loss may originate from a single discrete spot, multiple discrete areas or appear scattered throughout the colony.

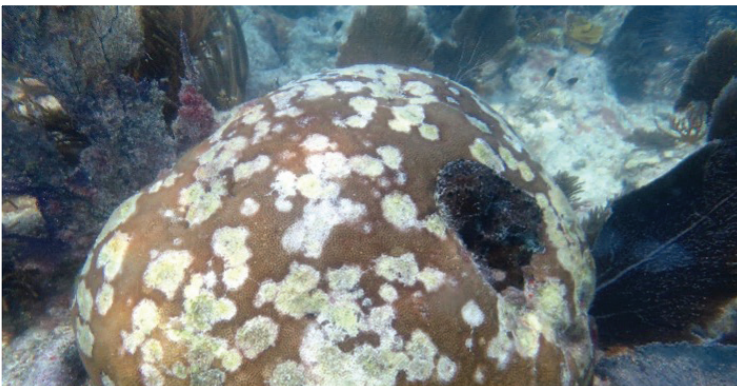
Some of the most recognizable diseases are the various “band” diseases, which have an advancing disease front that is often colored by the infectious agents. These diseases are named after the color of their band, such as black band and white band.

There is also a vast array of diseases lumped together that are difficult to identify because the symptoms may be indistinguishable from one another. In these cases, there are several key characteristics to note when describing coral disease including lesion pattern (single lesion or multiple lesions), the speed of progression (thin recent mortality margin or thick recent mortality margin) and any discoloration associated with tissue loss or unusual growth. By identifying these key characteristics and taking photos of the coral colony, it is possible to narrow down the potential disease affecting the coral.

Coral Disease or Biological Interaction?

Before attempting to identify the disease, it is important to look for characteristics that confirm the coral colony is experiencing disease instead of bleaching or biological interactions. To distinguish between coral bleaching and disease, look for live tissue and sharp margins. During bleaching, coral tissue is present but does not have its symbiotic algae, causing the tissue to look nearly transparent. With disease, there is typically a sharp, distinct line on the coral colony that separates the living/healthy and the diseased coral tissue.

Biological interactions are the effects organisms in a community have on one another such as predation, commensalism or competition. These interactions naturally occur on reefs and include abrasion from algae or hard-bodied invertebrates, fish bites or other forms of predation from marine worms, snails, barnacles, crabs and sea stars. These interactions may result in tissue loss and are likely accompanied by skeletal structure loss. With possible tissue loss, it may look like coral disease, but disease can be ruled out by investigating the surrounding environment. For example, it is best to look for fish species, such as parrotfish or butterflyfish, that are known to bite coral. Then, look at the coral colony for signs of burrowing or fish bite marks while making sure no other key characteristics of disease are present.



Stony coral tissue loss disease (SCTLD) is identified by patches of tissue loss lesions that are increasing in size and fusing together within intact tissue. Algae is starting to colonize areas of tissue loss on a colony of massive starlet coral (*Siderastrea siderea*). Photo by FWC.



Fish predation, identified by the bite mark, results in a loss of tissue and skeleton. There are no lesions, recent mortality or discoloration, which signifies coral disease is not present. The biological interaction is on a colony of mustard hill coral (*Porites astreoides*). Photo by DEP.

How Do Coral Reefs Recover?

Florida's Coral Reef is a national treasure that supports an abundance of marine life while providing opportunities for recreation, education and scientific research. Florida has become a leader for establishing a collaborative response to coral disease, specifically stony coral tissue loss disease (SCTLD).

Since 2014, Florida's Coral Reef has been experiencing a widespread coral disease outbreak from SCTLD. This disease was unprecedented due to its large geographic range, number of coral species affected, significantly high prevalence and high rates of disease transmission and

mortality. Fortunately, fast-growing branching corals are unaffected by this specific disease. As of 2024, the disease is considered endemic to the region.

Since the initial SCTLD outbreak in 2014, there has been several reports of coral colonies exhibiting signs of disease. Recognizing the urgent need, the Florida Department of Environmental Protection (DEP) led agencies and stakeholders in a process to develop, fund and implement a regional disease response plan. When a diseased coral is reported to the Southeast Florida Action Network (SEAFAN) BleachWatch Program in the **Kristin Jacobs Coral Aquatic Preserve**, DEP notifies the SCTLD intervention team members at Nova Southeastern University (NSU Florida).

NSU Florida's Geographic Information Systems (GIS) and Spatial Ecology lab strike team uses SEAFAN reports to locate diseased coral colonies, apply antibiotic treatments and mark the coral with a SEAFAN tag. These one-time antibiotic treatments of SCTLD have been 100% effective in aiding in one coral species survival for at least two years post-treatment.



A healthy coral reef is a vibrant ecosystem that teems with life and is home to many marine species. Photo by FWC.

From 2015-2023, Florida led a highly collaborative response to SCTLD, championed by four government agencies: DEP, Florida Fish and Wildlife Conservation Commission, National Ocean and Atmospheric Administration (NOAA) and the National Park Service, with help from over 60 partner organizations. The agencies and partners worked together on this response effort to conduct activities such as monitoring, data management, intervention, coral rescue, restoration and strategic partner building Caribbean-wide.

Over \$15 million has been allocated by the Florida Legislature, NOAA, U.S. Environmental Protection Agency and other sources to support disease response since 2015. In 2023, Florida expanded its collaborative response to include other disturbances such as other tissue loss diseases that affect branching corals, coral bleaching, anthropogenic impacts, water quality and others.

With strong partnerships, innovative technology and forward-thinking research, there is hope for Florida's Coral Reef. DEP and its partners are working daily to support the reefs' natural recovery processes through large-scale cultivation, outplanting and monitoring of genetically diverse, reef-building corals.

Resources

- [Florida Sea Grant Coral Health](#)
- [Florida Keys National Marine Sanctuary Coral Disease](#)
- [Atlantic and Gulf Rapid Reef Assessment Coral Disease Outbreak](#)
- [National Park Service SCTLD Best Practices for Dive Gear Decontamination](#)
- [DEP SCTLD Response](#)