Florida Department of Environmental Protection
Coral Reef Conservation Program

SEAFAN BleachWatch Program

Coral Disease Fact Sheet

About Coral Disease

Like all other animals, corals can be affected by disease. Coral disease was first recognized in the Florida Keys and the Caribbean in the 1970s, and since that time disease reports have emerged from reefs worldwide. Naturally, there are background levels of coral disease but reports of elevated disease levels – often called disease outbreaks – have been increasing in both frequency and severity over the past few decades. Today, coral disease is recognized as a major driver of coral mortality and reef degradation.

Disease affecting Great Star Coral (*Montastraea cavernosa)*. Photo credit: Nikole Ordway-Heath (Broward County; 2016).

Coral disease can result from infection by microscopic organisms (such as bacteria or fungi) or can be caused by abnormal growth (akin to tumors). The origins or causes of most coral diseases are not known and difficult to determine. There is increasing evidence that environmental stressors, including increasing water temperatures, elevated nutrient levels, sewage input, sedimentation, overfishing, plastic pollution, and even recreational diving, are increasing the prevalence and severity of coral diseases. There is also strong evidence that a combination of coral bleaching and disease can be particularly devastating to coral populations. This is likely due to corals losing a major source of energy during a bleaching event, reducing their ability to fight off or control disease agents.

Coral disease is often identifiable by a change 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 that 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 the black band disease. There is also a suite of diseases lumped together that are difficult to diagnose because the symptoms of which may be indistinguishable from one another. In these cases, there are several key characteristics to note when describing coral disease including color, lesion pattern, and speed of progression across a colony.

Close-up of the disease lesion on a boulder brain coral *(Colpophylia natans)*. Photo credit: Florida Fish and Wildlife Conservation Commission (upper Florida Keys; 2016).

How to Identify Coral Disease

Coral disease can be tricky to identify. Before attempting to determine what a disease is, you need to ensure that you are indeed seeing disease. To do that, you should first rule out the two major alternatives: bleaching and phyiscal-biological interactions. To rule out coral bleaching, you need to

look for live tissue. During bleaching, the coral tissue is present but without its symbiotic algae which causes the tissue to look nearly transparent. Please consult the BleachWatch Coral Bleaching Fact Sheet for tips and tricks to identify coral bleaching correctly.

Physical-biological interactions happen naturally on a reef and can include abbrasion from algae or hard-bodied invertebrates, fish bites, or other forms of predation. These interactions can best be ruled out by investigating the surrounding enviroment and using your knowledge of the reef ecoyststem. For example, you can pause to look for fish species that are known to bite coral (such as parrotfish or butterflyfish) or watch large clumps of macroalgae growing near coral to see if there is an 'interaction zone' between the two. You should always take note of these physical-biological interactions, as some coral pathogens can use these types of lesions to infect a colony.

Once you determine that you are looking at tissue loss associated with disease, you should note some of the important disease characteristics which are outlined on the BleachWatch datasheet. These include noting the lesion pattern (single lesion or multiple lesions), the speed of progression (thin margin or thick margin), and any discoloration assoicated with tissue loss or unusal growth. Armed with this data (and, importantly, any photos that you take), we can begin to narrow down the potential diseases affecting the coral.

Florida's Coral Reef Disease Outbreak

In late 2014, elevated levels of a coral disease were reported off the coast of Miami-Dade. Since that time, the disease had spread to the northern reaches of Florida's Coral Reef (FCR) in Martin County and (as of 2020) as far south as the Marquesas. While disease outbreaks have occurred on FCR in the past, this outbreak is unprecedented in several ways. First, the oubreak does not follow any seasonality – often diseases will flare up during warmer months and subside during cooler ones, but this disease has progressed uninterrupted for over six years. Second, while most diseases affect a handful of species at most, this disease has been reported to impact roughly half of Florida's 45 reef building corals. Finally, and perhaps most troublingly, this disease has a nearly 100% mortality rate of affected colonies and species. This disease, now termed Stony Coral Tissue Loss Disease (SCTLD), is arguably the most devastating coral disease ever reported. Federal and state agencies are working closely with researchers, non-governmental organizations, private industry professionals, veterenarians and citizens scientists like you to monitor and respond to this outbreak. To learn more about this outbreak, please visit DEP's coral disease page: https://floridadep.gov/rcp/coraldisease

Unknown disease observed on a Massive Starlet Coral *(Siderastrea siderea)*. Photo credit: Sara Thanner (Miami-Dade County; 2016).

Further Reading

- DEP Florida Reef Tract Coral Disease Outbreak https://floridadep.gov/rcp/coraldisease
- Florida Keys National Marine Sanctuary (FKNMS) Coral Disease: https://floridakeys.noaa.gov/coral-disease/
- Field Manual for Investigating Coral Disease (NOAA) https://www.coris.noaa.gov/activities/cdhc_fieldmanual/
- Coral Disease Handbook – Guidelines for Assessment, Monitoring and Management (USGS) https://www.nwhc.usgs.gov/hfs/Globals/Products/Coral%20Disease%20Handbook.pdf