Coral Disease Outbreak Across Florida Reef Tract 2014 – Ongoing

Overview:

Florida's coral reefs are currently experiencing a multi-year outbreak of coral disease. While disease outbreaks are not unprecedented, this event is unique due to the presence of multiple diseases that have affected at least 21 species of coral across the Florida Reef Tract. These diseases are highly prevalent and are estimated to have resulted in the mortality of millions of corals across southeast Florida, Biscayne National Park, the Upper Florida Keys and Dry Tortugas National Park. In fall 2014, isolated sites with significant coral disease were reported near Key Biscayne in Miami-Dade County. In April 2015, the Florida Department of Environmental Protection's Coral Reef Conservation Program (CRCP) staff confirmed significant disease was present at individual Miami-Dade sites. Local scientists reported that coral disease had spread to multiple sites across Miami-Dade County. By fall 2015, widespread disease was confirmed across approximately 55 linear miles of reef, including locations as far north as Pompano Beach in Broward County and as far south as Biscayne National Park. A few isolated disease observations were also reported in Palm Beach County.

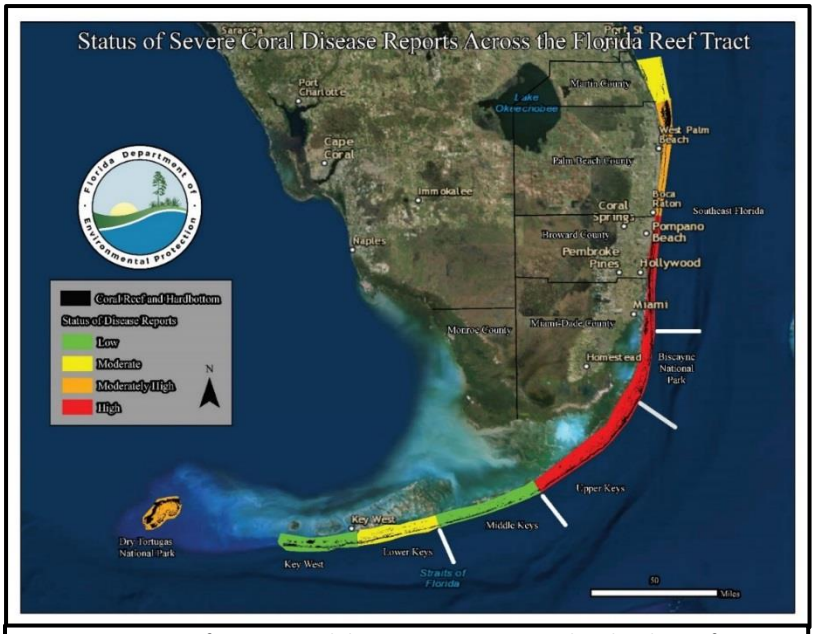

Figure 1: Status of severe coral disease reports across the Florida Reef Tract.

Throughout 2016, severe coral disease spread to locations further north and south than observed in previous years. By summer 2016, reports of widespread disease were confirmed across approximately 126 linear miles of reef, including locations as far north as Jupiter in Palm Beach County, and south into the upper Florida Keys and the Dry Tortugas (Figure 1). Disease reports continued into early 2017. Although the original outbreak areas have shown a decline in active disease cases, this is potentially due to high mortality rates among the initially affected corals. Reports indicate that active disease continues to spread north and south at a consistent rate. During this time frame, both new sites were reportedly affected by disease, and disease at existing sites continued to progress. It is estimated that this multi-year disease event has resulted in the partial or total mortality of millions of corals across the Florida Reef Tract, with the impact range continually expanding.

Species Affected:

The following species have been affected by the coral disease outbreak.

Acropora Cervicornis (Staghorn coral)*, *Acropora palmata* (Elkhorn coral)*, *Colphyphllia natans* (Boulder brain coral), *Dendrogyra cylindrus* (Pillar coral)*, *Dichocoenia stokesi* (Elliptical star coral), *Diploria labyrinthiformis* (Grooved brain coral), *Eusmilia fastigiata* (Smooth flower coral), *Meandrina meandrites* (Maze coral), *Montastraea cavernosa* (Great star coral), *Mycetophyllia spp.* (Cactus coral)*, *Orbicella annularis* (Lobed star coral)*, *Orbicella faveolata* (Mountainous star coral)*, *Orbicella fransksi* (Boulder star coral)*, *Porites astreoides* (Mustard hill coral), *Pseudodiploria strigosa* (Symmetrical brain coral), *Pseudodiploria clivosa* (Knobby brain coral),

Siderastrea radians (Lesser starlet coral), *Siderastrea siderea* (Massive starlet coral), *Solenastrea bournoni* (Smooth star coral), *Stephanocoenia intersepta* (Blushing star coral).

* Indicates species listed under the U.S. Endangered Species Act.

Response Efforts:

The exact cause and contributing factors for this event will likely take years to identify; however, addressing other known coral stressors (i.e., water quality, turbidity and sedimentation, etc.) will increase the ability of the corals to recover. Since 2015, the Florida Department of Environmental Protection (DEP) and numerous partners from federal, state and local governments, universities, non-governmental organizations, and the South Florida community have been communicating regularly and working together on a multi-faceted response effort to:

- Document prevalence, severity and impacts associated with the disease outbreak;
- Identify likely pathogens;
- Understand potentially contributory environmental factors;
- Experiment with treatments and other interventions; and
- Seek additional capacity and funding to support more comprehensive response efforts.
- Create a region-wide Reef Ambassador and SEAFAN program to facilitate stakeholder assistance

List of Partner Associations Currently Assisting in Various Disease Event Response Activities:

Broward County, Coral Restoration Foundation, Cry of the Water, Florida Aquarium, Florida Atlantic University, Florida Department of Environmental Protection (Florida Coastal Office, Florida Parks Service), Florida Fish and Wildlife Conservation Commission (Fish and Wildlife Research Institute), Florida International University, George Mason University, Keys Marine Laboratory, Martin County, Miami-Dade County, Mote Marine Laboratory, National Oceanic and Atmospheric Administration (Coral Reef Conservation Program, Coral Disease and Health Consortium, Florida Keys National Marine Sanctuary), National Park Service(Biscayne National Park, Dry Tortugas National Park, South Florida/Caribbean Network), Nova Southeastern University/National Coral Reef Institute, Palm Beach County, Palm Beach County Reef Rescue, Southeast Florida Coral Reef Initiative, Smithsonian Institution, The Nature Conservancy, United States Geological Survey (National Wildlife Health Center), University of Florida, University of Miami Rosenstiel School of Marine and Atmospheric Science, University of South Florida

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Background Information

- **The National Oceanic and Atmospheric Administration (NOAA) has declared that 2014-2017 was the 3rd Global Coral Bleaching Event – with the worst coral bleaching since 1998 when we functionally lost between 15 percent and 20 percent (almost 1/5th) of the world's coral reefs.**
- It is still unknown what caused the initial disease outbreak. We know that marine ecosystems are finely balanced and minor disruptions are often overcome due to the resilience or health of the ecosystem. However, the unusually warm water temperatures of the past several years may have exacerbated the existing local threats (e.g., sedimentation, land based sources of pollution, etc.) which likely weakened the resilience ability of the corals. This imbalance may have pushed the ecosystem over a tipping point that allowed naturally occurring viruses, bacteria, and other microorganisms to become lethal.
- As these global and local threats to coral reefs are increasing in frequency and severity, it challenges natural resource management agencies to establish a more effective way of working together locally to use our combined limited resources to achieve strategic priority natural resource management outcomes.