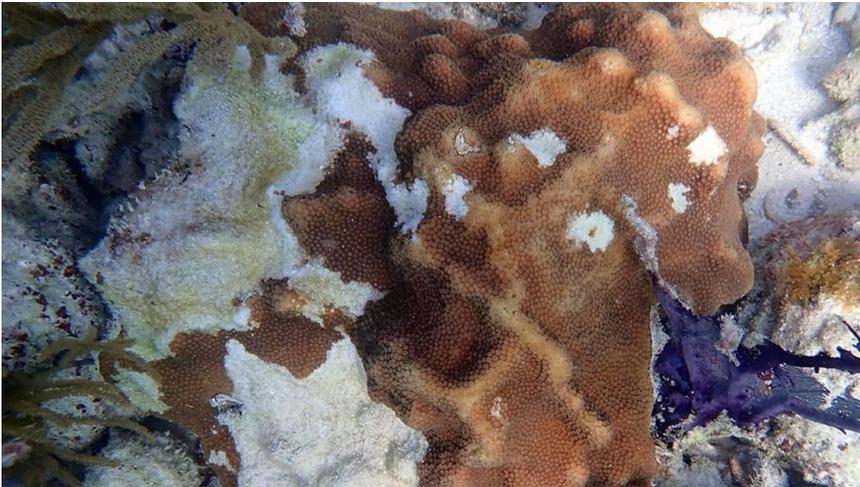


Mystery disease spreads, threatens coral reefs in the Lower Florida Keys | Miami Herald

<http://www.miamiherald.com/news/local/environment/article209447494.html>



A mysterious disease spreading across Florida's reef tract, the third largest barrier reef in the world, has now spread to the Lower Keys. The outbreak is now the longest and largest infectious disease outbreak for any coral. **Florida Fish and Wildlife Conservation Commission**

ENVIRONMENT

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A mysterious disease hammering Florida's dwindling reefs was found for the first time this week in the Lower Keys, alarming scientists who've used epoxy band-aids, amputated sick coral and even set up underwater "fire breaks" in a four-year battle to contain the outbreak.

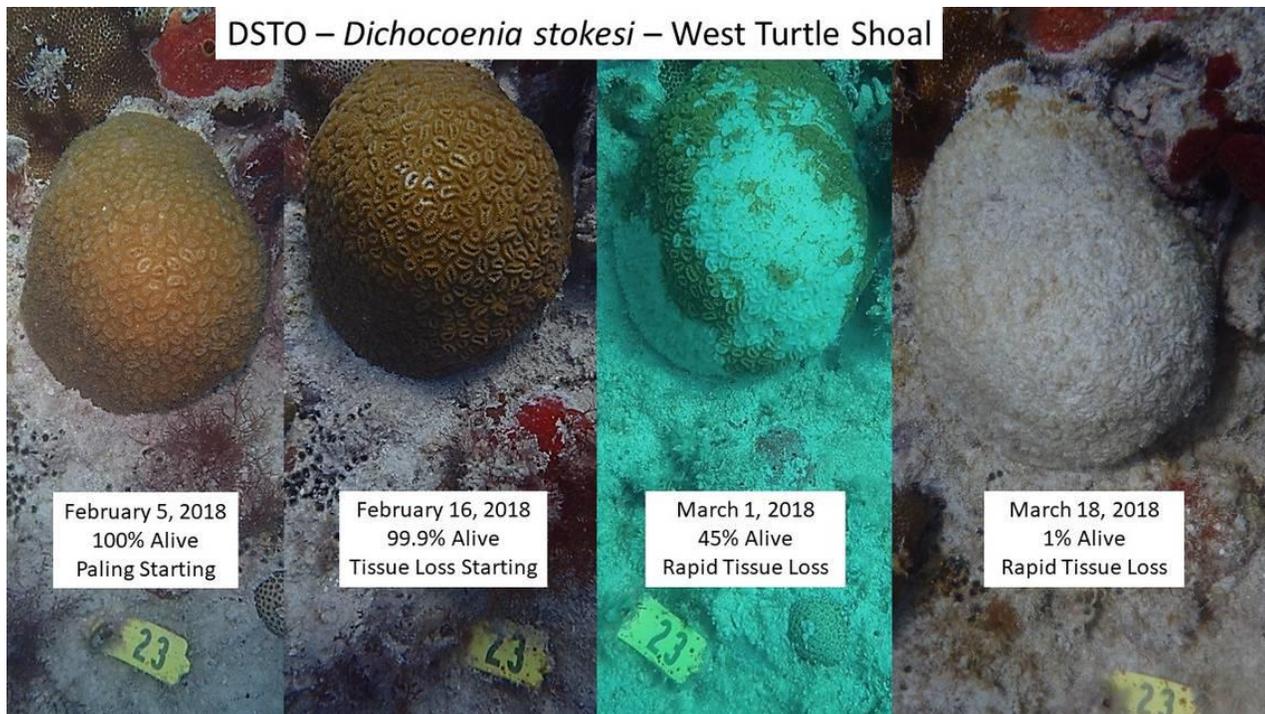
Florida Keys Community College researchers working with state and federal investigators discovered the infected coral during a routine dive to collect samples, said Mote Marine Laboratory biologist Erinn Muller.

The discovery off Looe Key, south of Big Pine in part of the Florida Keys National Marine Sanctuary, puts in jeopardy the southern end of the world's third-largest barrier reef — a scuba-diving destination renowned for its biological diversity. It's also more bad news for a reef that has lost half its coral over the last two centuries, is [already suffering impacts](#) from climate change, and has emerged from a [three-year bleaching event](#).

"It is just heartbreaking for us because it's such an iconic reef," Muller said. "I can't sleep at night because I think about it and what else can we do. "

The disease, which now stands as the longest and largest infection for coral anywhere, jumped a gap in the 360-mile long [reef tract](#) at the Seven Mile Bridge, a point scientists had hoped would provide a natural

obstacle. It first appeared off Virginia Key in 2014 and began spreading north, south and west. But until November 2017, it appeared to stop at the east end of the famous Keys bridge, Muller said.



Coral researchers tracked the death of this coral off Marathon east of the Seven Mile Bridge between February and March. This week scientists discovered the disease has moved west to the Lower Keys.

Courtesy of Florida Fish and Wildlife Conservation Commission

Scientists believe the disease is likely caused by a bacterial infection carried by currents, but little else is known.

The Florida Current, which flows around the Florida Straits north into the Gulf Stream, likely carried it to Martin County, with smaller eddies spreading it south and west, Muller said. When coral began falling sick near Virginia Key, the U.S. Army Corps of Engineers was in the midst of dredging Government Cut. Miami-Dade County also has a massive sewage outfall pipe nearby. It's not clear whether either triggered the disease, or contributed to the spread on already stressed coral that also endured back-to-back warm summers beginning in 2014.

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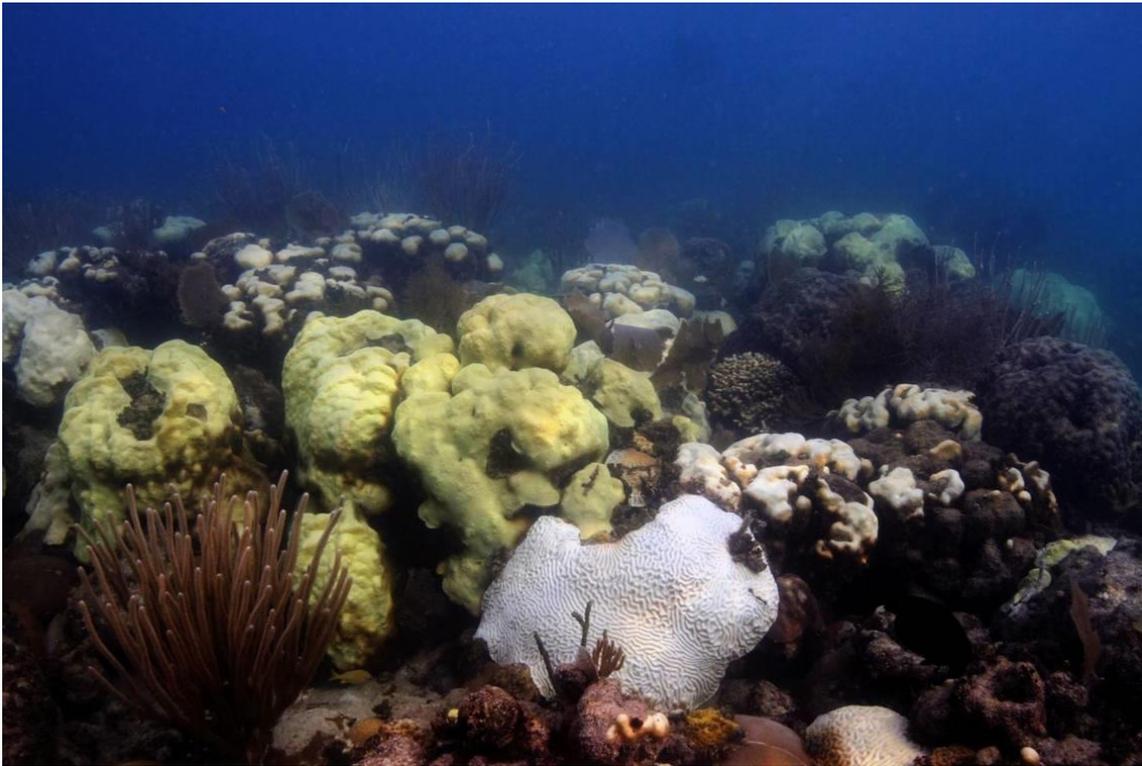
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UM researchers seed coral reefs off Key Biscayne

A team of researchers and students are planting branches clipped from a coral nursery off Key Biscayne. **Pedro Portal** Miami Herald

"We have this one unique event and nobody was there figuring all these things out as it was happening," she said. "We'll do our best to go back and recover information, but as of right now I'm not convinced we'll ever know."

A large [team of researchers](#) led by the Florida Department of Environmental Protection with help from the National Oceanic and Atmospheric Administration, universities and nonprofits including Mote have set up a joint investigation. They have so far been unable to identify the bacteria causing the disease because they've been unable to grow cultures. Coral, like people, collect countless bacteria – some good and some bad. To identify the bad, researchers need to grow the suspected pathogens and apply it to healthy coral in a lab.



Beginning in 2014, a worldwide bleaching event damaged coral in South Florida and other parts of the planet.

Photo by Derek Manzello

Scientists also suspect currents are spreading the disease, but Muller said it has sometimes moved in unexpected ways.

"It definitely has hot places," she said. "You have certain reefs getting infected but then it seems to hop over a reef and show up in a different area than where we expect."

They're also working to identify vulnerable coral and find ways to treat or at least contain the damage.

Play Video

http://www.miamiherald.com/latest-news/2i71r0/picture209495999/alternates/FREE_1140/bleached%20coral.jpg

3:46

A New View of Coral Reefs

A three-year NASA field expedition to examine Earth's coral reefs is now underway, giving scientists the opportunity to study reefs' ecology and condition. **McClatchy**Science at NASA

Brain and large boulder coral, the tract's biggest reef builders, appear to be more susceptible, but scientists aren't sure why, Muller said. They've tried a number of ways in lab experiments to treat it — cutting out sick coral, applying chlorine-laced epoxy as a band-aid to create an antiseptic barrier and carving out fire breaks around reefs. They're also experimenting with a paste laced with antibiotics, trying to find a balance that will treat the coral but not contaminate reefs that already struggle with antibiotics from sewage outfall.

DLAB - *Diploria labyrinthiformis* – Grooved Brain Coral Patch Reef off Grassy Key

January 22, 2018 - Pale Area Appears

February 5, 2018 - 1% Diseased

February 16, 2018 - 5% Diseased



March 1, 2018 - 15% Diseased

March 18, 2018 - 20% Diseased

April 5, 2018 - 25% Diseased



Coral researchers believe brain coral, like this off Grassy Key, are more susceptible to the disease.

Florida Fish and Wildlife Conservation Commission

But coral continue to die at an alarming rate.

"Some species are becoming extinct within certain regions," Muller said. "We're having basically local extinctions."

The only other comparable disease outbreak occurred in the 1970s and '80s and nearly wiped out staghorn and elkhorn corals, which landed both on the endangered species list. Scientists still don't know what caused them to become sick., but Muller said there's more hope for this epidemic. Coral science has advanced dramatically in the last four decades and reef rebuilding efforts started, with nurseries from the Keys to Miami growing coral. In recent years, Mote alone has planted 35,000 with plans to plant another 25,000 this year. Scientists are also working on [developing more resilient coral](#).

Play Video

1:51

One-of-a-kind lab designed to help coral fight for their lives

A coral restoration team, including UM Rosenstiel School of Marine and Atmospheric Science marine biologist Andrew Baker and Rivah Winter, an Inventor-in-Residence and curator at the Frost Museum of Science, are stress-testing coral. **EMily Michot**Miami Herald

"It's just so hard when you talk about the marine environment because of how connected it is," she said. "It's just mind-boggling to try to develop something that's large enough to have a real impact."

This story was updated. Florida Keys Community College researchers first discovered the disease and treatment methods have so far only been performed in lab settings.

Follow Jenny Staletovich on Twitter @jenstaletovich