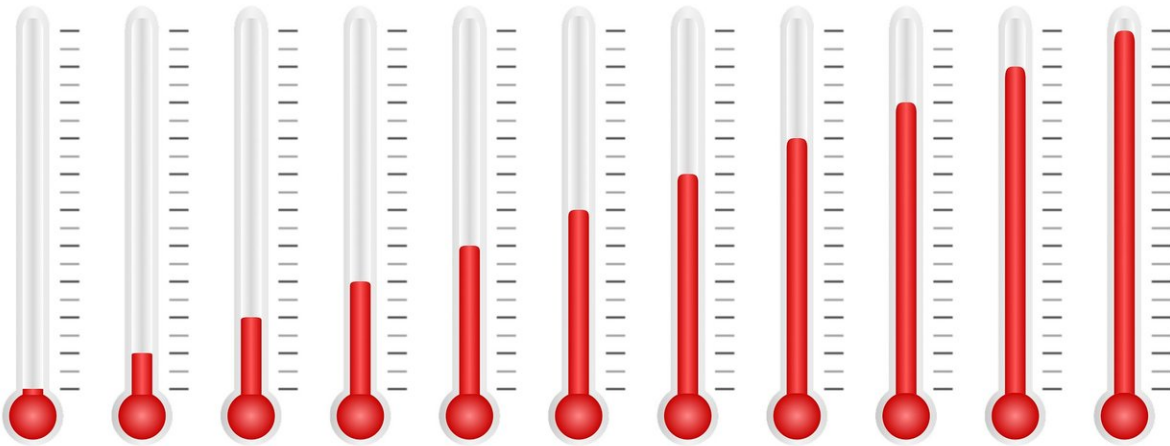


# Florida corals in hotter water than first thought. Scientists blame 'weird phenomenon'

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Entire reefs in the Florida Keys are ghost towns, victims of an unseasonably early and severe marine heat wave that likely won't end anytime soon that's already bleached and killed thousands of corals.

But the picture may be even worse than that, scientists said, thanks to a "weird phenomenon" affecting the reefs along the Middle and Lower Keys.

Derek Manzello, coordinator of NOAA's Coral Reef Watch program, said although the entire Caribbean is seeing widespread bleaching due to higher-than-usual temperatures, he believes Florida's reef tract is faring worse than any other.

That could be because of what lies on the other side of the island chain that makes up the Keys—Florida Bay.

To the east of the Keys is the Atlantic Ocean, where the Florida reef tract stretches from south of Key West up into Broward County. On the west of the island chain of the Keys lies Florida Bay, a broad and largely coral-free body of [water](#) that rarely is deeper than ten feet.

That [shallow water](#) heats up faster than the Atlantic and has led to many of the triple-digit water temperature readings that have made headlines. It also evaporates quickly in the summer heat.

"What happens is Florida Bay gets really, really hot and really, really salty," said Manzello.

That hotter, saltier water is dense, so it sinks to the bottom. Currents drag that water east, through breaks in the island chain like the seven-mile bridge, and out to sea.

From there, Manzello said, that dense water sits like a hot, thick shroud around the corals at the bottom of the sea, enveloping them in even hotter water than [surface temperatures](#) measured by satellites.

"We end up getting these pulses of very hot salty water that's moving across the bottom of the reefs," he said. "This is extremely stressful for the corals because they're basically getting bathed in these really, really hot waters."

So while satellites are measuring [sea surface temperatures](#) in the Florida Keys about five to seven degrees Fahrenheit higher than usual, a potentially deadly temperature for most corals, Manzello said temperatures at the sea floor could be two to four degrees hotter.

Manzello said he's verified this finding from temperature measurements taken by divers, some of whom say they can feel the change in temperature as they go deeper—an unusual "inverse thermocline" rather than the natural pattern of hotter water at the shallow surface and cooler water at the bottom.

Last week at Sombrero Reef, offshore of Marathon, divers registered a temperature of more than 92 degrees Fahrenheit at the sea floor, two degrees higher than satellite measurements of the surface.

The Florida Keys has had temperature sensors in place on its reefs for a decade, but as soon as next month, scientists could start getting real-time data from [temperature](#) buoys installed as part of a NOAA project to monitor seven "mission iconic" reefs, including Cheeca Rocks.

That important data could help scientists track this bleaching event, and the future ones made even more common and intense by unchecked climate change.

"What's happening in Florida is really the harbinger of what's happening on a [massive scale](#)," Manzello said. "The entire Caribbean sea right now is hotter than it normally is so unless we have some changing weather pattern, basically we're marching toward what could potentially be a Caribbean-wide event."

## 'Devastation' at Cheeca Rocks

It's hard to imagine things getting much worse on the Florida reef tract,

where at least two coral nurseries and one wild reef have seen 100% bleaching, and in some cases, total mortality of coral fragments at a nursery.

Ian Enochs, lead of the coral program at the Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, dove on one of the most popular and densely coral-packed reefs in the Keys earlier this week, Cheeca Rocks in the upper Keys, near Islamorada.

What he saw was "total devastation."

"Every single coral was bleaching," he said. "It's shocking. It was literally every single coral. They just gave up."

The scene of bone-white coral after bone-white coral was all the more tragic considering the reef's previous status as one of the heartier and more resilient reefs in the Keys, which led one coral scientist to lovingly refer to it as "a junkyard dog of a reef."

Enochs said the damage was so severe the "sea of white" was visible from the boat circling the reef.

"This is one of the most beautiful and persistent reefs in the Florida Keys, and it's entirely dead," he said. "It's hard for me to emotionally wrap my brain around 100%."

Worse yet, he said, is that marine temperatures usually don't peak around Florida until mid to late August, which could mean another two months of coral-killing hot water.

Enochs, whose lab at NOAA is dedicated to finding solutions and technology to help restore the state's fragile coral [reef](#), said he believes it's possible to save the colorful, biodiverse reefs that thousands of

species call home.

But that takes investment locally into labs and technology to research the issues and a global movement to cut carbon emissions and slow down the rate of global warming, the No. 1 threat to the world's reefs.

"I hope this shows our back is against the wall," he said. "I really hope the scale and how bad it's gotten wakes people up."

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