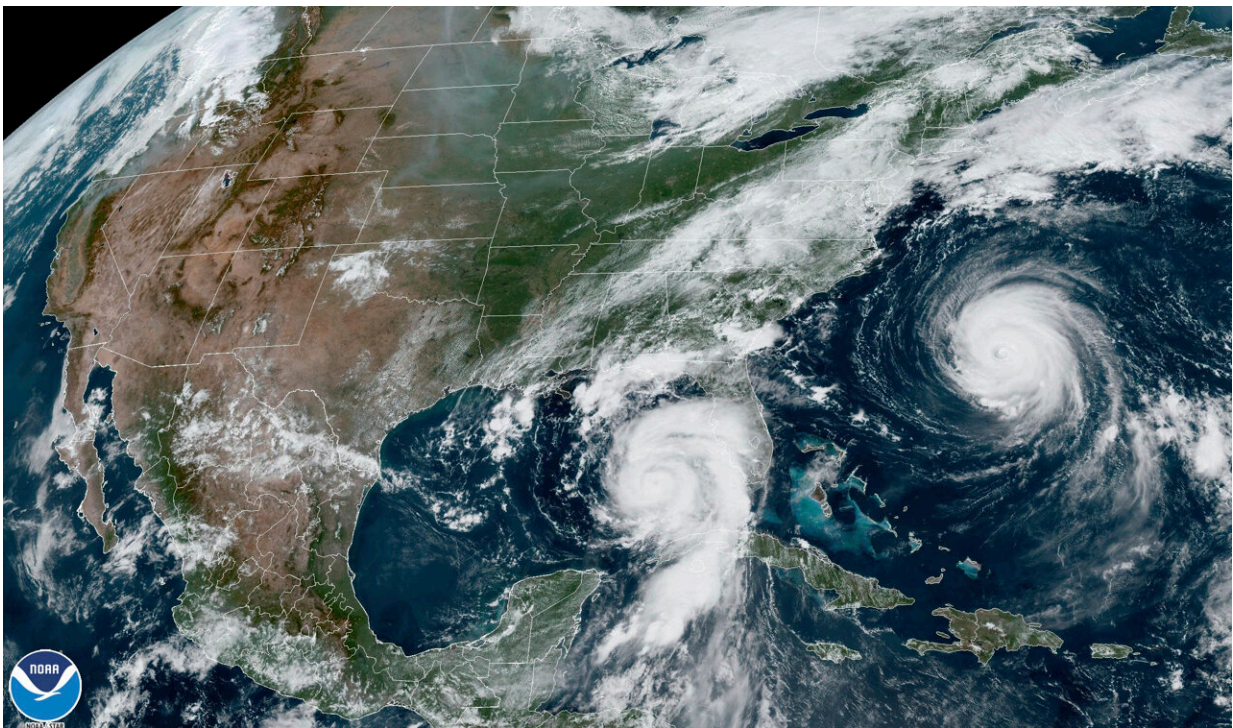


What makes Idalia so potent? It's feeding on intensely warm water that acts like rocket fuel

August 30 2023, by Seth Borenstein



This Tuesday, Aug. 29, 2023, 1:31 p.m. EDT satellite image provided by the National Oceanic and Atmospheric Administration shows Hurricane Idalia, center, approaching Florida's Gulf Coast, and Hurricane Franklin, right, as it moves along the East coast of the United States, southwest of Bermuda. Feeding on some of the hottest water on the planet, Hurricane Idalia is expected to rapidly strengthen as it bears down on Florida and the rest of the Gulf Coast, scientists said. Credit: NOAA via AP

Feeding on some of the hottest water on the planet, [Hurricane Idalia](#) is rapidly strengthening as it bears down on Florida and the rest of the Gulf Coast. It's been happening a lot lately.

"It's 88, 89 degrees (31, 32 degrees Celsius) over where the storm's going to be tracking, so that's effectively rocket fuel for the storm," said Colorado State University hurricane researcher Phil Klotzbach. "It's basically all systems go for the storm to intensify."

That water "is absurdly warm and to see those values over the entire northeast Gulf is surreal," said University of Miami hurricane researcher Brian McNoldy.

Hurricanes [get their energy from warm water](#). Idalia is at an all-you-can-eat buffet.

"What makes this so tough and so dangerous is" that Idalia is moving so fast and intensifying so rapidly, some people may be preparing for what looked like a weaker storm the day before instead of what they'll get, said National Weather Service Director Ken Graham.

Idalia "stands a chance of setting a record for intensification rate because it's over water that's so warm," said MIT hurricane professor Kerry Emanuel. On Tuesday, only a few places on Earth had conditions—mostly warm water—so primed for a storm's sudden strengthening, he said.



Visitors to the Southernmost Point buoy brave the waves made stronger from Hurricane Idalia on Tuesday, Aug. 29, 2023, in Key West, Fla. Feeding on some of the hottest water on the planet, Hurricane Idalia is expected to rapidly strengthen as it bears down on Florida and the rest of the Gulf Coast, scientists said. Credit: Rob O'Neal/The Key West Citizen via AP

"Right now I'm pretty sure Idalia is rapidly intensifying," Emanuel said.

At the time Emanuel said that, Idalia was clocking 80 mph winds. A couple hours later it was up to 90 mph, and by 10 p.m. Idalia was a Category 2 hurricane with 110 mph winds, having gained 40 mph in wind speed in 21 hours. A storm officially rapidly intensifies when it gains 35 mph in wind speed in 24 hours.

Scientists have been talking all summer about how record hot oceans are at the surface, especially in the Atlantic and near Florida, and how deeper water—measured by something called ocean heat content—keeps [setting records](#) too because of human-caused climate change. The National Hurricane Center's forecast discussion specifically cited the ocean heat content in forecasting that Idalia would likely hit 125 mph winds before a Wednesday morning landfall.

Idalia's "rapid intensification is definitely feeding off that warmth that we know is there," said University at Albany atmospheric sciences professor Kristen Corbosiero said.



Beachgoers stay close to shore as choppy waves caused by gusty wind crash on Hollywood Beach, Fla., Tuesday, Aug. 29, 2023. Feeding on some of the hottest water on the planet, Hurricane Idalia is expected to rapidly strengthen as it bears

down on Florida and the rest of the Gulf Coast, scientists said. Credit: AP Photo/Marta Lavandier

That [warm water](#) is from a mix of human-caused climate change, a natural El Nino and other random weather events, Corbosiero and other scientists said.

And it's even more. Idalia has been parked at times over the Loop Current and eddies from that current. These are pools of extra warm and deep water that flow up from the Caribbean and into the Gulf of Mexico, Corbosiero said.

Deep water is important because hurricane development is often stalled when a storm hits cold water. It acts like, well, cold water thrown on a pile of hot coals powering a steam engine, Emanuel said. Often storms themselves pull the brake because they churn up cold water from the deep that dampens its powering up.

Not Idalia. Not only is the water deeper down warmer than it has been, but Idalia is going to an area off Florida's western coast where the water is not deep enough to get cold, Emanuel said. Also, because this is the first storm this season to go through the area no other hurricane has churned up cold water for Idalia to hit, Klotzbach said.



Workers at Toucans Bar and Grill board up the restaurant windows ahead of Hurricane Idalia near Clearwater Beach Tuesday, Aug. 29, 2023, in Clearwater, Fla. Residents along Florida's gulf coast are making preparations for the effects of Idalia. Credit: AP Photo/Chris O'Meara

Another fact that can slow strengthening is upper level crosswinds, called shear. But Idalia moved into an area where there's not much shear, or anything else, to slow it down, the hurricane experts said.

A [hurricane](#) getting stronger just as it approaches the coast should sound familiar. Six hurricanes in 2021—Delta, Gamma, Sally, Laura, Hannah and Teddy—rapidly intensified. Hurricanes Ian, Ida, Harvey and Michael all did so before they smacked the United States in the last five years, Klotzbach said. There have been many more.

Storms that are nearing the coastlines, within 240 miles (400 kilometers), across the globe are rapidly intensifying three times more now than they did 40 years ago, a study published last week found. They used to average five times a year and now are happening 15 times a year, according to a [study published](#) in *Nature Communications*.

"The trend is very clear. We were quite shocked when we saw this result," said study co-author Shuai Wang, a climatology professor at the University of Delaware.



Storm clouds loom over riverfront homes in Steinhatchee, Fla., ahead of the expected arrival of Hurricane Idalia, Tuesday, Aug. 29, 2023. Feeding on some of the hottest water on the planet, Hurricane Idalia is expected to rapidly strengthen as it bears down on Florida and the rest of the Gulf Coast, scientists said. Credit: AP Photo/Rebecca Blackwell



Vistors stop and take a photo of the clouds on the south end of Tybee Island, Ga., ahead of Hurricane Idalia on Tuesday, Aug., 29, 2023. Idalia strengthened into a hurricane Tuesday and barreled toward Florida's Gulf Coast. Credit: Stephen B. Morton /Atlanta Journal-Constitution via AP

Scientists, such as Wang and Corbosiero, said when it comes to a single storm such as Idalia, it's hard to blame its rapid intensification on climate change. But when scientists look at the big picture over many years and many storms, other studies have shown a [global warming connection to rapid intensification](#).

In his study, Wang saw both a natural climate cycle connected to storm activity and warmer sea surface temperatures as factors with rapid intensification. When he used [computer simulations](#) to take out warmer

water as a factor, the last-minute strengthening disappeared, he said.

"We may need to be a little bit careful" in attributing blame to [climate change](#) to single storms, Wang said, "but I do think Hurricane Idalia demonstrates a scenario that we may see in the future."

More information: Yi Li et al, Recent increases in tropical cyclone rapid intensification events in global offshore regions, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-40605-2](https://doi.org/10.1038/s41467-023-40605-2)

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