Ocean temperatures are off the charts. Here's where they're highest.

By Tim Meyer and Carolyn Gramling
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Data is as of July 24

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The Earth's oceans have never been warmer. Every day since late March, the world's average sea surface temperature has been well above the previous highest mark for that day. And there will be ripple effects: Marine heat waves are affecting about 44 percent of the global ocean, whereas only 10 percent is typical, and they can have "significant impacts on marine life as well as coastal communities and economies," according to the National Oceanic and Atmospheric Administration.

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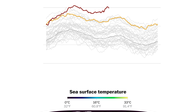
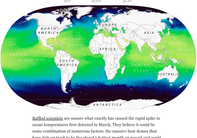
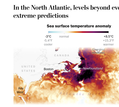




Baffled scientists are unsure what exactly has caused the rapid spike in ocean temperatures that occurred in March. They believe it could be some combination of numerous factors: the massive heat dome that have July on track to be the planet's hottest month on record and could make this the hottest year on record; reduced air pollution from ships; weaker winds carrying less Saharan dust over the Atlantic Ocean; and the influence of human-caused climate change and El Niño, which itself is an abnormal warming of the waters in the tropical Pacific Ocean that alters weather patterns worldwide.

The exceptionally warm oceans are making heat waves worse, disrupting marine life and destroying coral reefs. They are also intensifying floods and flooding by increasing land temperatures, and could make hurricanes stronger. Here, we take you on a tour of the worst of the ocean's hot spots.

In the North Atlantic, levels beyond even extreme predictions



The North Atlantic has baked in record-daily warmth every day since early March. With the average sea surface temperature in the region now approaching 77 degrees Fahrenheit, as hot as it's ever been and more than 2.5 degrees above average, the North Atlantic has warmed almost beyond the most extreme predictions of climate models.

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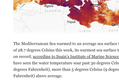
The hottest zone has shifted from near Britain to Iceland, to the waters off the coast of Newfoundland, which this month have heated to a staggering 9 to 10 degrees Celsius (5 to 18 degrees Fahrenheit) above normal. This region heated water could fuel stronger storms later this summer and fall.

"Here we do have some evidence that something exceptional is happening in North Atlantic sea surface temperatures," wrote Zeke Hausfather, a climate scientist at Berkeley Earth and the tech company Stripe. "The specific drivers of this anomaly ... are still under investigation by scientists so it will be some time before we know for sure what's driving these regional extremes."

Waters around Florida have reached distressing levels

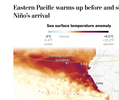
Scientists were shocked when ocean temperatures around the Florida Keys climbed into the mid-90s in early July. A temperature of 101.1 degrees, more typical of a hot tub than ocean water, was recorded Monday by a buoy in Manatee Bay in the south of Miami. Many buoys in the area were reading at or above 95 degrees earlier this week.



Ocean waters surrounding Florida have steadily warmed as the state experiences its hottest June on record with most of South Florida on pace for its hottest year on record. In March, the heat index reached 100 degrees or higher on 46 consecutive days, shattering the previous longest stretch of 32 days.

As that sweltering heat wave continues, the ocean temperatures are searing, and historically warm waters are damaging coral reefs, with one researcher calling it the "worst bleaching event that Florida has ever seen." In a visit last week to Southern Reef, south of Marathon in the Florida Keys, scientists found "much coral mortality." The ocean warmth could also help hurricanes maintain their intensity or rapidly intensify near land.

In the Mediterranean, hot oceans fueling deadly fires



The Mediterranean Sea warmed to an average sea surface temperature of 28.7 degrees Celsius this week, its warmest sea surface temperature on record, according to Spain's Institute of Marine Sciences. Some areas have seen the water temperature soar past 30 degrees Celsius (86 degrees Fahrenheit), more than 3 degrees Celsius (5 degrees Fahrenheit) above average.

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The waters across the Mediterranean have warmed rapidly since early July amid record heat across much of southern Europe this month. Excessively warm temperatures included a high of 108.4 degrees Fahrenheit (42 degrees Celsius) Monday on the Italian island of Sardinia, the highest July temperature in Europe on record.

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The heat is helping to fuel deadly wildfires in Greece and several other southern European and northern African countries. Raging fires forced the evacuation of 19,000 tourists and residents on the Greek island of Rhodes, the country's largest wildfire evacuation.

Eastern Pacific warms up before and since El Niño's arrival

The eastern and central Pacific Ocean near the equator has continued to heat up since NOAA declared the arrival of El Niño in early June. Sea surface temperatures are generally 3 to 4 degrees Celsius (5 to 7 degrees Fahrenheit) above average in the eastern Pacific, with localized areas of more than 5 degrees Celsius (9 degrees Fahrenheit) above average off the coasts of Peru and Ecuador.

The abnormally warm coastal waters, which had already risen to about 6 degrees Celsius (10 degrees Fahrenheit) above normal in April, prompted Peru's national meteorological service to issue a "coastal El Niño alert" because such warm waters diminish or displace fish populations and intensify rainfall, such as that which caused flooding and landslides in recent years in the Ecuadorian province of Escuadar in early July.

The development of El Niño, which is typically associated with warmer global temperatures and bouts of extreme weather, has increased the odds of this year becoming Earth's warmest on record. El Niño also tends to reduce hurricane activity in the Atlantic Ocean, although the extremely warm ocean waters there could counteract that impact. Forecasters say there is a greater than 90 percent chance that El Niño will continue through the upcoming winter.

Record heat and rain in the Northern Pacific

Water temperatures well above normal stretch across the northern Pacific Ocean from Asia to North America. Sea surface temperatures are especially warm around Japan, which has seen record heat, record rainfall and deadly flooding this month. Tokyo has reached higher than 95 degrees Fahrenheit nine times in July, a record number for the month, while several cities have set records for hourly and daily rainfall, according to meteorologist Sayaka Mori.

Weather historians Maximiliano Herrera tweeted "hundreds of records here Julies so far in Japan and hundreds more will fall." He called it "one of the worst heat waves in Japanese history." Temperatures are "brutally hot" in East Asia, Herrera tweeted, including in Vietnam, Hong Kong, southern China and Taiwan, where Typhoon Doksuri, Typhoon Saola and Tropical Storm Haikui made landfall Friday in southeast China.

Waters aren't quite as warm off the west coast of Canada. But sea surface temperatures around 2 to 4 degrees Celsius (3 to 7 degrees Fahrenheit) above normal could be contributing to the country's worst wildfire season ever and to scorching temperatures that reached as high as 100 degrees Fahrenheit in the Northwest Territories.

Arnudatar Ajuya and Brady Dennis contributed to this report.

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Temperature data for the maps as of July 24 from NOAA's Coral Reef Watch.

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