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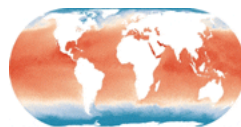
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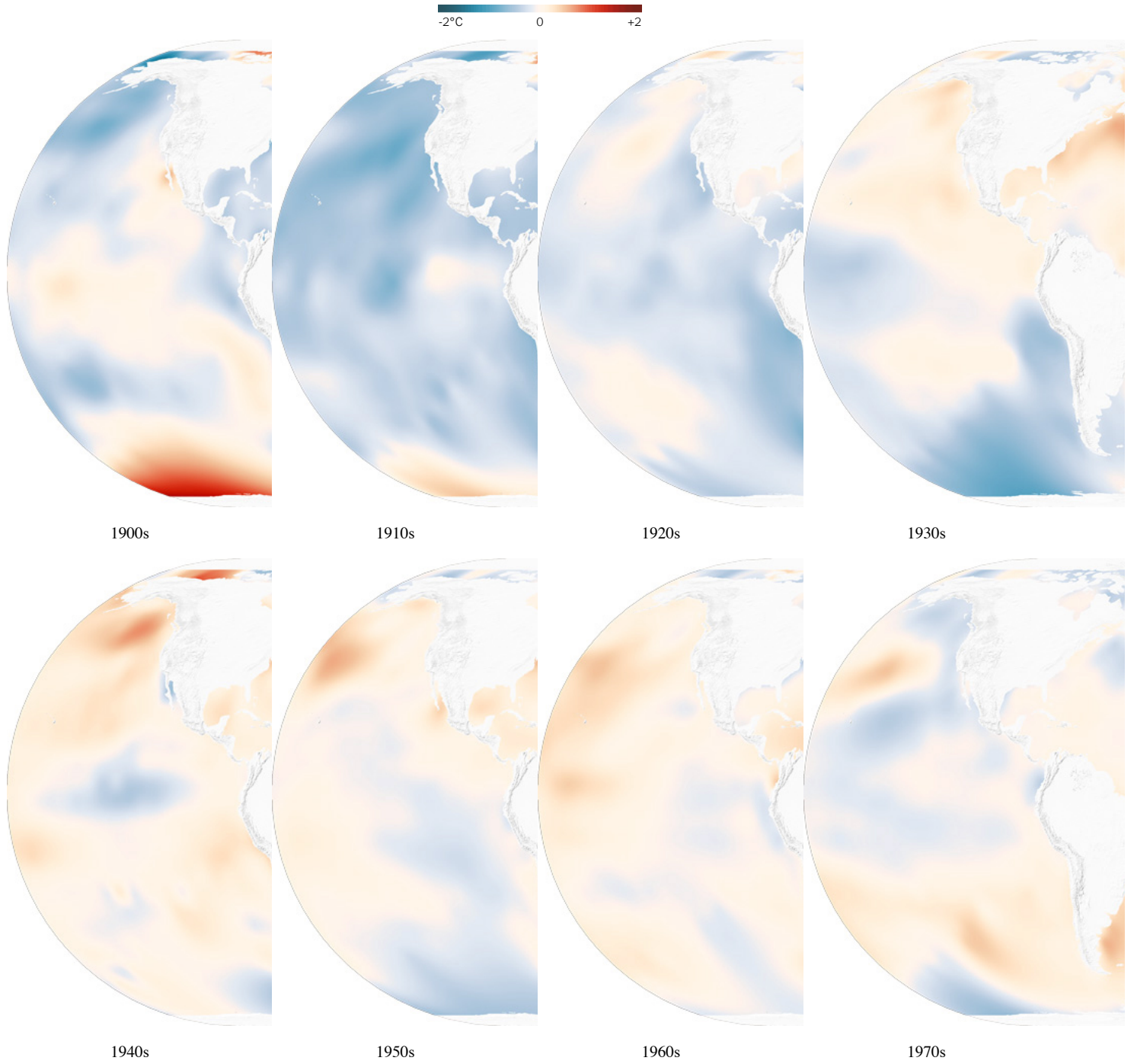


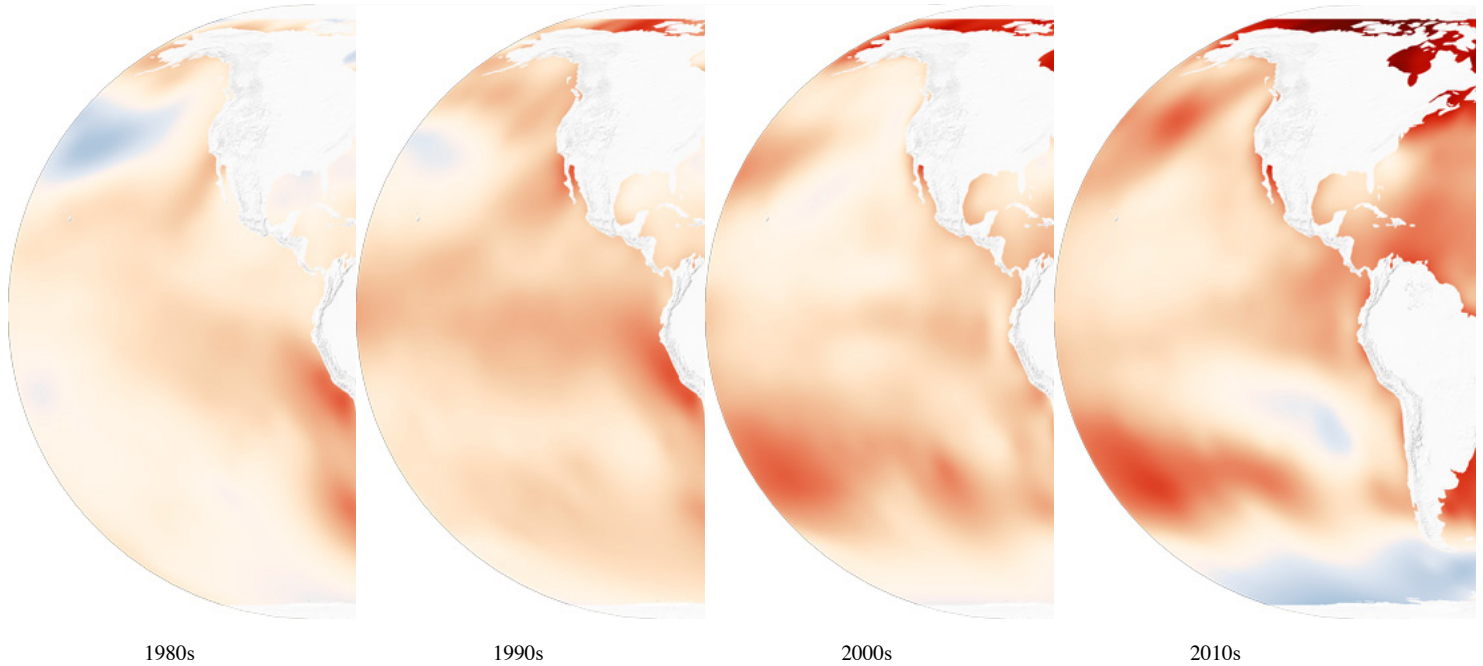
Oceans Are Absorbing Almost All of the Globe's Excess Heat

By [TIM WALLACE](#) SEPT. 12, 2016

This year is on track to be the third consecutive hottest year on record. Where does that heat go? The oceans, mostly.

Where the Oceans Have Been Colder and Hotter Than Average





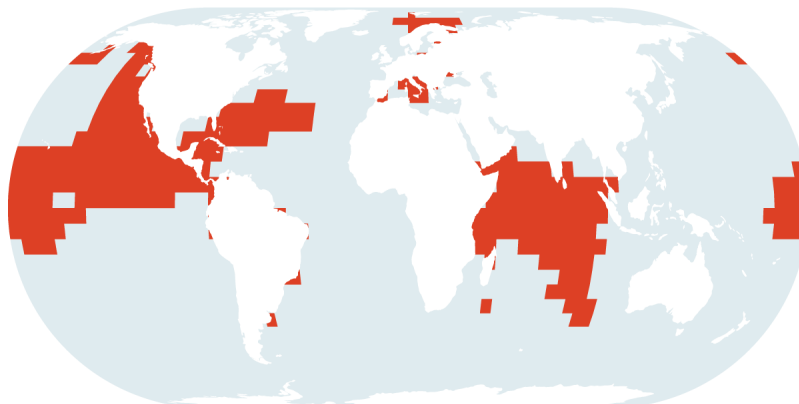
Average temperatures from each decade compared with the 20th-century average.

Ocean temperatures have been consistently rising for at least three decades. Scientists believe that global sea surface temperatures will continue to increase over the next decade as greenhouse gases build up in the atmosphere.

According to a [report by the International Union for Conservation of Nature](#) released last week, the Southern Hemisphere has experienced intense warming over the past decade, with strong heat accumulation in the midlatitude regions of the Pacific and Indian Oceans.

Natural patterns such as El Niño and La Niña can have year-to-year effects on temperatures. Individual storms can also influence ocean temperatures for months or longer. But the overall temperature trends by decade reveal a backdrop of human-caused warming.

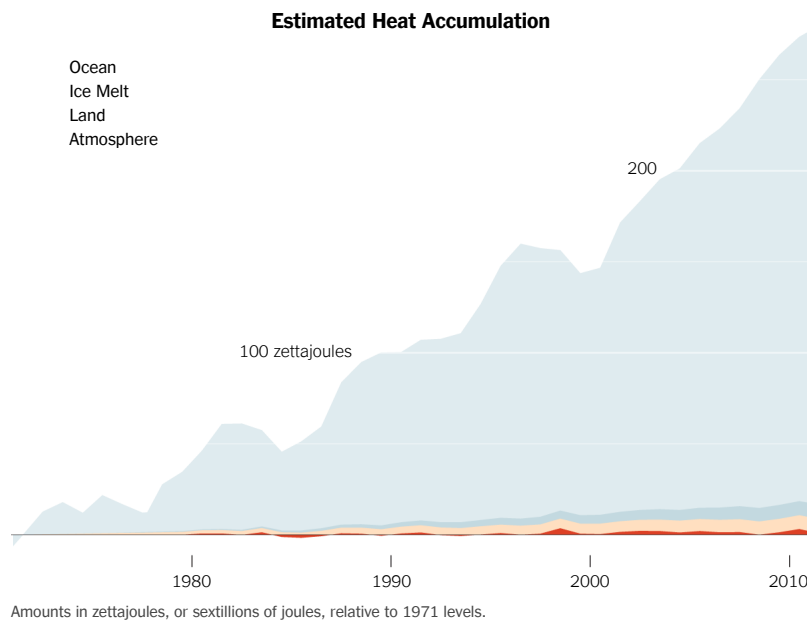
Record High Annual Mean Surface Temperatures, 2015



Last year, nearly all observed ocean surface temperatures registered above average because naturally occurring conditions caused by El Niño combined with human-induced warming. About a quarter of those observations broke **record highs**.

Heat Accumulates in the Oceans

Since 1955, more than 90 percent of the excess heat retained by the Earth as a result of increased greenhouse gases has been absorbed by the oceans, leaving ocean scientists like Eric Leuliette at the National Oceanic and Atmospheric Administration feeling that **90 percent of the climate change story is being ignored**.



For several decades, more energy has been absorbed than emitted at the top of Earth's atmosphere. According to Gregory Johnson, an oceanographer at NOAA, the rate of energy gained between 1971 and 2010 was roughly equal to the power required to run 140 billion 1,500-watt hair dryers over the same number of years. The rate has only increased in the past decade.

This excess energy has largely been sucked up by the oceans, which have a huge capacity to store heat. As the oceans store more heat, however, they expand. Scientists have shown that over the past decade, this thermal expansion has caused about one-third of the rise in sea levels.

What Hotter Oceans Bring

The oceans act as Earth's enormous heat sponge, sheltering continents and the people who live on them from atmospheric

extremes. The near-surface ocean takes only decades to warm in response to elevated greenhouse gas concentrations, but the deep ocean will take centuries to millenniums, raising sea level all the while. In the meantime, warmer ocean temperatures may also increase the destructive potential of extreme weather, like cyclones and hurricanes.

In fact, the effects of warmer waters are already widespread.