

Climate change made 2024 the hottest year on record. The heat was deadly

Unbearable heat waves around the world killed scores of people and upended daily life



A boy in Delhi pours water on himself to cool off during a heat wave in May. The territory set a record-high temperature of nearly 122° Fahrenheit.

SONU MEHTA/HINDUSTAN TIMES/GETTY IMAGES

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Over and over, the numbers tell the same story: 2024 was Earth's hottest year on record, knocking [the previous record holder](#) — 2023 — out of the top spot (*SN*: [12/6/23](#)). But temperatures alone can't describe [the human cost](#): humidity that challenges the body's ability to cool itself; nighttime temps that rob people of sleep; power outages; wildfire smoke; ruined crops; rising cases of mosquito-borne disease (*SN*: [9/20/24](#)).

Meanwhile, record-breaking water temperatures in the Atlantic Ocean and the Gulf of Mexico [fueled hurricanes Helene and Milton](#) (*SN*: [10/9/24](#)).

Helene's torrential rains [caused flooding across six states](#) in the U.S. Southeast, killing over 200 people (*SN*: 10/1/24).

Other parts of the world have their own stories to tell about the impact of 2024's extreme heat. Here are some of those accounts.

Phoenix | *May–September*

Arizona's capital experienced 113 straight days of daytime temperatures topping 100° Fahrenheit, with hundreds of heat-related deaths recorded. Phoenix has one of the world's largest urban heat-island magnitudes: City temperatures are about 12 degrees higher than those in surrounding rural areas.

Mexico City | *May–June*

[An extreme heat wave](#), on top of an extended drought, caused blackouts and was linked to over 120 deaths. The resulting water scarcity raised fears that North America's largest metropolis was just weeks from Day Zero — a theoretical day when the region would run out of water.

São Paulo | *August–September*

Extreme heat in the Southern Hemisphere's winter plus prolonged drought fueled wildfires in Brazil's Amazon rainforest. Fine particles in São Paulo's air were 14 times the World Health Organization's recommended limit, causing the city to be ranked as the world's most polluted for four consecutive days, from September 9 to September 12.

Rio de Janeiro | *March*

During a heat wave in Brazil, the maximum measured temperature reached 107.6° F. But it felt even hotter. The heat index — a measurement that also includes humidity — soared to a record 144.1° F, testing the limits of humans' heat tolerance.

Manila | *April*

The Philippines' megalopolis of over 14 million people sweltered through a deadly 15-day heat wave, an event that would have been impossible

without climate change. The heat brought water shortages, crop losses and school closures.



A vendor in Manila opens an umbrella to block the sun amid a 15-day heat wave in April. The heat wave would have been impossible without human-caused climate change, scientists say.
AARON FAVILA/AP PHOTO

Paris | *July–August*

Temperatures during the Olympics may not have broken records, but they were still scorching. Without climate change, Paris would have been about 5 degrees cooler, researchers determined. That made the Games more dangerous for athletes. [Europe is the world's fastest-warming continent](#), heating at a rate twice the global average.

Longyearbyen | *July–August*

August temps in the world's northernmost settlement, on Norway's Spitsbergen Island, were the highest ever recorded for that month, soaring to 68° F — more than 3 degrees higher than the previous record, set in 1997. In July, ice caps there broke the all-time record for daily melting, losing ice at a rate five times the norm.

Bamako | *February–April*

Heat waves across West Africa's Sahel region caused power cuts and spikes in hospital admissions. From April 1 to April 4, a hospital in Mali's capital recorded a total of 102 deaths; the previous year, the hospital noted 130 deaths for all of April. Climate change amped up daytime highs by 2.7 degrees and kept nights 3.6 degrees warmer than usual.

Gaza | April

A three-day heat wave exacerbated the humanitarian crisis in Palestine. Nearly 2 million displaced people in refugee camps and overcrowded shelters lacked protection from the heat and faced water and food shortages, power outages, limited access to health care and spikes in waterborne diseases.

Delhi | May–June

India's capital territory endured 40 straight days of daytime highs reaching 104° F, with a new record set on May 28 of 121.8° F. The unrelenting heat killed over 100 people, the nonprofit organization HeatWatch India estimates.

East Antarctica | July

At winter's peak, temperatures across a big chunk of the continent hovered at -4° F, about 50 degrees higher than normal. The event was the largest temperature anomaly anywhere this year.

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CITATIONS

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Climate crisis deepens with 2024 'certain' to be hottest year on record

Average global temperature in November was 1.62C above preindustrial levels, bringing average for the year to 1.60C

Damian Carrington *Environment editor*

Mon 9 Dec 2024 03.00 GMT

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A wildfire in California this year. Fires driven by severe droughts have affected the western US, Canada, the Amazon forest and particularly the Pantanal wetlands. Photograph: David McNew/Getty Images

This year is now almost certain to be the hottest year on record, data shows. It will also be the first to have an average temperature of more than 1.5C above preindustrial levels, marking a further escalation of the climate crisis.

Data for November from the EU's [Copernicus Climate Change Service \(C3S\)](#) found the average global surface temperature for the month was 1.62C above the level before the mass burning of fossil fuels drove up global heating. With data for 11 months of 2024 now available, scientists said the average for the year is expected to be 1.60C, exceeding the record set in 2023 of 1.48C.

Samantha Burgess, the deputy director of C3S, said: “We can now confirm with virtual certainty that 2024 will be the warmest year on record and the first calendar year above 1.5C. This does not mean that the Paris agreement has been breached, but it does mean ambitious climate action is more urgent than ever.”

The Paris climate agreement commits the 196 signatories to keeping global heating to below 1.5C in order to limit the impact of climate disasters. But this is measured over a decade or two, not a single year.

Nonetheless, the likelihood of keeping below the 1.5C limit even over the longer term appears increasingly remote. The CO2 emissions heating the planet are expected to keep rising in 2024, despite a global pledge made in late 2023 to “transition away from fossil fuels”.

Fossil fuel emissions must fall by 45% by 2030 to have a chance of limiting heating to 1.5C. The recent Cop29 climate summit failed to reach an agreement on how to push ahead on the transition away from coal, oil and gas. The C3S data showed that November 2024 was the 16th month in a 17-month period for which the average temperature exceeded 1.5C.

The supercharging of extreme weather by the climate crisis is already clear, with heatwaves of previously impossible intensity and frequency now striking around the world, along with fiercer storms and worse floods.

Particularly intense wildfires blazed in North and South America in 2024, the EU’s Copernicus Atmosphere Monitoring Service (Cams) reported last week. The fires, driven by severe droughts, affected the western US, Canada, the Amazon forest and particularly the Pantanal wetlands.

Mark Parrington, a senior scientist at Cams, said: “The scale of some of the fires in 2024 were at historic levels, especially in Bolivia, the Pantanal and parts of the Amazon. Canadian wildfires were again extreme although not at the record scale of 2023.” The fires caused high levels of air pollution across continents for weeks, he said.

The economic damage caused by extreme weather is rising, according to the research institute of insurance firm Swiss Re. Its data found that estimated economic losses in 2024 rose by 6% to \$320bn, a figure 25% higher than the average over the previous 10 years.

Hurricanes Helene and Milton and more severe thunderstorms in the US, as well as floods in Europe and the UAE, contributed to insured losses. But less than half the losses across the world were covered by insurance as poorer people were unable to afford the premiums.

“Losses are likely to increase as climate change intensifies extreme weather events, while asset values increase in high-risk areas due to urban sprawl. Adaptation is therefore key, and protective measures, such as dykes, dams and flood gates, are up to 10 times more cost-effective than rebuilding,” Swiss Re said.