

# 2023 on track to be the hottest year on record, say scientists

Last month was hottest October since records began, with average global temperature thought to be 1.7C above late-1800s levels

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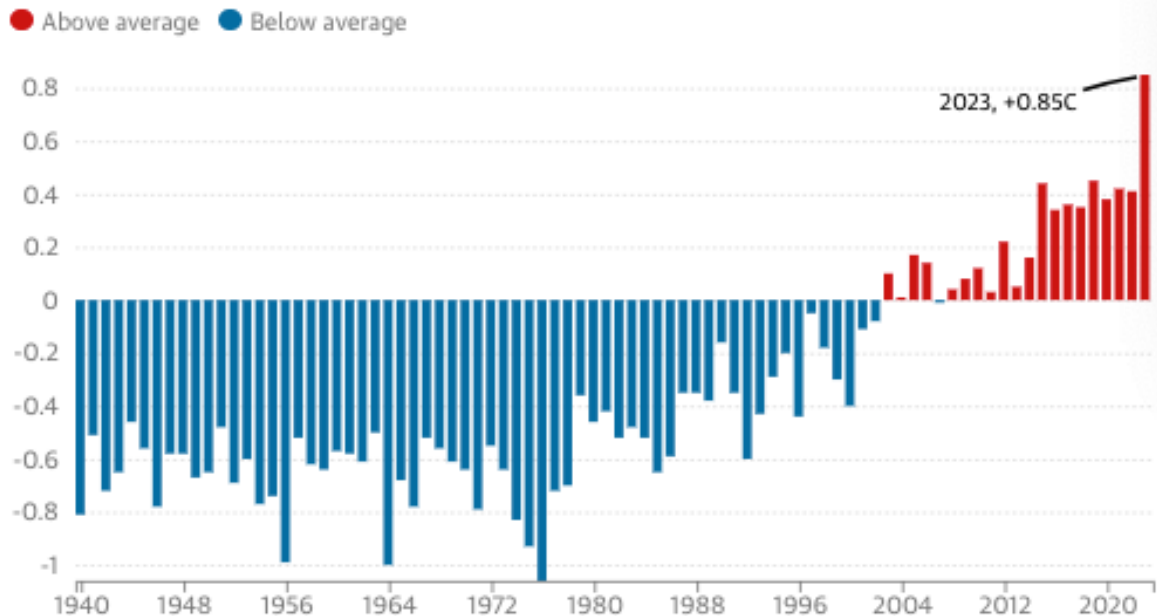
- Wildfires advance towards the eastern town of Palma de Gandia in Valencia, Spain, on 3 November. Photograph: Andreu Esteban/AP
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The world is set to have been hotter in 2023 than in any other year on record, scientists have declared, before a landmark climate summit this month.

“We can say with near certainty that 2023 will be the warmest year on record, and is currently 1.43C above the pre-industrial average,” said Samantha Burgess, the deputy director of the Copernicus Climate Change Service. “The sense of urgency for ambitious climate action going into **Cop28** has never been higher.”

## October 2023 was the warmest October on record

Showing the global surface air temperature anomaly for each October from 1940 to 2023. The temperature anomaly is the difference between the temperature for a given month and the average from 1991 to 2020



Guardian Graphic | Source: Copernicus/C3S/ECMWF

The Copernicus scientists found last month was the hottest October on record globally, with temperatures 1.7C above what they were thought to have been during the average October in the late 1800s.

By burning fossil fuels and destroying nature, humans have pumped heat-trapping gases into the atmosphere that have raised the temperature of planet by 1.2C since the Industrial Revolution. The global temperature anomaly for October 2023 was the second highest across all months in its dataset, the scientists found, behind only the month before.

“The fact that we’re seeing this record hot year means record human suffering,” said Friederike Otto, a climate scientist at Imperial College London. “Within this year, extreme heatwaves and droughts made much worse by these extreme temperatures have caused thousands of deaths, people losing their livelihoods, being displaced, etc. These are the records that matter.

“That is why the Paris agreement is a human rights treaty, and not keeping to the goals in it is violating human rights on a vast scale.”



### 'Everything is parched': Amazon struggles with drought amid deforestation

At a summit in Paris eight years ago, world leaders promised to try to stop the planet heating by 1.5C by the end of the century. But current policies are set to heat it by about 2.4C.

Akshay Deoras, a meteorology research scientist at the University of Reading, said: "The sizzling October 2023 is another unfortunate example that shows how temperature records are getting shattered by a humongous margin. Global warming due to increased greenhouse gas emissions and El Niño in the tropical Pacific Ocean are hitting the planet really hard."

Record heat last month left **scientists stunned**. They expect the extreme temperatures to have been driven by a powerful mix of greenhouse gas pollution, the return of the natural weather pattern El Niño, and a handful of other factors including a drop in sulphur pollution and a volcanic eruption in Tonga.

Copernicus said El Niño conditions had continued to develop but that the temperature anomalies so far were lower than those reached during previous strong events in 1997 and 2015.

"It is frightening to see that the global temperature since June 2023 is much warmer than that during the second half of 2015, when El Niño was much stronger," said Deoras. "Our planet continues to pass through unfortunate

milestones in its meteorological history, and it won't be surprising to see new records in subsequent months.”

Copernicus found the average global mean temperature between January and October 2023 was the highest on record. It beat the 10-month average for 2016 – the current record holder for the hottest year – by 0.1C.

Richard Allan, a climate scientist at the University of Reading, said: “Only with rapid and massive cuts in greenhouse gas emissions, across all sectors, can we avoid these repeating headlines of record-breaking warmth and, more importantly, limit the growing severity of wet, hot and dry extremes that accompany a rapidly warming world.”