

# Hottest January on record mystifies climate scientists

EU monitor says global temperatures were 1.75C above preindustrial levels, extending run of unprecedented highs

*Agencies*

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Unseasonal storm clouds brought by La Niña loom over an outback campsite in Rainbow Valley, Australia. Photograph: Genevieve Vallee/Alamy

A run of record-breaking global temperatures has continued, even with a [La Niña](#) weather pattern cooling the tropical Pacific.

The Copernicus Climate Change Service said last month was the warmest January on record, with surface – air temperatures 1.75C above preindustrial levels.

The EU-funded Earth observation programme highlighted wetter-than-average conditions in eastern Australia and drier-than-average conditions in other parts of the country.



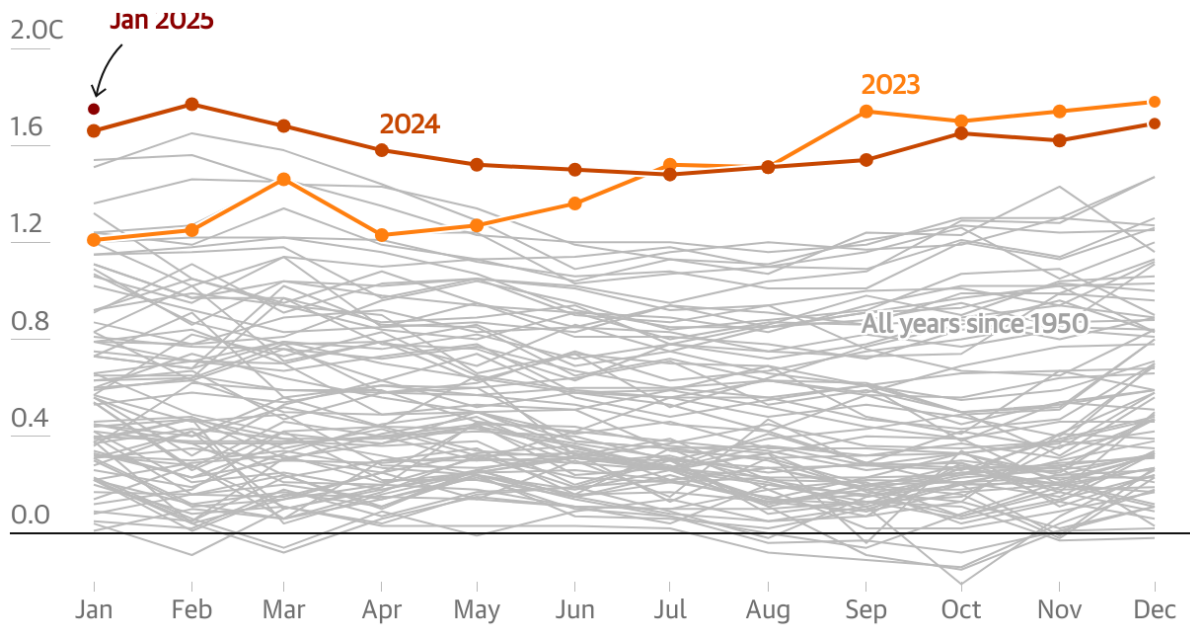
Climate change target of 2C is 'dead', says renowned climate scientist

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Samantha Burgess, the strategic lead for climate at the European Centre for Medium-Range Weather Forecasts, said: "January 2025 is another surprising month, continuing the record temperatures observed throughout the last two years ... Copernicus will continue to closely monitor ocean temperatures and their influence on our evolving climate throughout 2025." Sea-surface temperatures remained unusually high in many ocean basins and seas.

## January 2025 was the hottest on record

Global monthly temperature anomalies, relative to a 1850 -1900 baseline



Guardian graphicSource: Copernicus, C3S/ECMWF

January marked the 18th month of the past 19 to record global-average surface temperatures above the 1.5C preindustrial level. Under the Paris climate agreement, world leaders said they would try to prevent global temperatures rising by more than 1.5C – but the threshold was based on long-term multidecadal warming and not short-term monthly temperatures.

Climate scientists had expected this exceptional spell to subside after a warming El Niño event peaked in January 2024 and conditions shifted to an opposing, cooling La Niña phase.

But the heat has lingered at record or near-record levels, prompting debate about what other factors could be driving it to the top end of expectations.

Julien Nicolas, a climate scientist at Copernicus, told Agence France-Presse: “This is what makes it a bit of a surprise: you’re not seeing this cooling effect, or temporary brake at least, on the global temperature that we were expecting to see.”

La Niña is expected to be weak, and Copernicus said prevailing temperatures in parts of the equatorial Pacific Ocean suggested a slowing or stalling of the move towards the cooling phenomenon. Nicolas said it could disappear by March.

Last month, Copernicus said global temperatures averaged across 2023 and 2024 had exceeded 1.5C for the first time. This did not represent a permanent

breach of the long-term 1.5C target under the Paris climate accord but it was a clear sign the limit was being tested.

Scientists say every fraction of a degree of warming above 1.5C increases the intensity and frequency of extreme weather events such as heatwaves, heavy rainfall and droughts.

Copernicus said Arctic sea ice in January hit a monthly record low. Analysis from the US this week showed it was the second-lowest in that dataset. Overall, 2025 is not expected to follow 2023 and 2024 into the history books: scientists predict it will rank the third-hottest year yet.



Greenland ice sheet cracking more rapidly than ever, study shows

Copernicus said it would closely monitor ocean temperatures for hints about how the climate might behave. Oceans are an important climate regulator and carbon sink, and cooler waters can absorb greater amounts of heat from the atmosphere, helping to lower air temperatures. They also store 90% of the excess heat trapped by humanity's release of greenhouse gases.

Nicolas said: "This heat is bound to resurface periodically. I think that's also one of the questions: is this what has been happening over the past couple of years?"

Sea-surface temperatures were exceptionally warm in 2023 and 2024, and Copernicus said readings in January were the second highest on record. "That is the thing that is a little puzzling – why they remain so warm," Nicolas said.

Scientists are unanimous that burning fossil fuels has driven long-term global heating, and that natural climate variability can also influence temperatures from one year to the next.

But natural warming cycles such as El Niño could not alone explain what had taken place in the atmosphere and seas, and answers were being sought elsewhere.

One theory is that a global shift to cleaner shipping fuels in 2020 accelerated warming by reducing sulphur emissions that make clouds more mirror-like and reflective of sunlight.

In December, another peer-reviewed paper looked at whether a reduction in low-lying clouds had let more heat reach the Earth's surface. "It's really still a matter of debate," Nicolas said.

The EU monitor uses billions of measurements from satellites, ships, aircraft and weather stations to aid its calculations. Its records go back to 1940, but other sources of climate data – such as ice cores, tree rings and coral skeletons – enable scientists to expand their conclusions using evidence from much further in the past.

Scientists say the current period is likely to be the warmest the planet has been in 125,000 years.