2025

GLOBAL CLIMATE

HIGHLIGHTS

PROGRAMME OF THE EUROPEAN UNION

Copernicus — Europe's eyes on Earth

Climate Change Service — climate.copernicus.eu

Atmosphere Monitoring Service — atmosphere.copernicus.eu

IMPLEMENTED BY ECMWF

ECMWF Communication Section
Copernicus Team

European Centre for Medium-Range
Weather Forecasts, ECMWF
Robert-Schuman-Platz , 53175 Bonn, Germany
copernicus-press@ecmwf.int

Published January 14th 2026 updated January 28th 2026
(figures 3 and 9 and the associated text have been updated
to reflect full availability of global datasets for 2025).

DOI:https://doi.org/10.24381/b3nm-p354

This Global Climate Highlights (GCH) report from the Copernicus Climate Change Service (C3S) provides a brief synopsis of the state of global climate in 2025, mainly based on data from the ERA5 global atmospheric reanalysis produced by the European Centre for Medium-range Weather Forecasts (ECMWF). The Global Climate Highlights summarises the state of global air temperature, global sea surface temperature and sea ice in both polar regions. This report also assesses current global average temperatures relative to the 1.5°C limit set by the Paris Agreement, adopted by the Conference of the Parties in 2015.

ERA5 is one of six international datasets used to track global average temperature. In addition to this report, which includes data from the *Japanese Reanalysis for Three Quarters of a Century (JRA-3Q*), further 2025 global temperature updates will be released by the UK Met Office, NASA, NOAA, Berkeley Earth and the World Meteorological Organisation (WMO), based on their respective datasets.
A complementary report on the European State of the Climate, providing more detail on conditions in Europe, will be published by ECMWF and the C3S in April 2026, in partnership with the WMO.

2025

GLOBAL CLIMATE

HIGHLIGHTS

Table of Contents

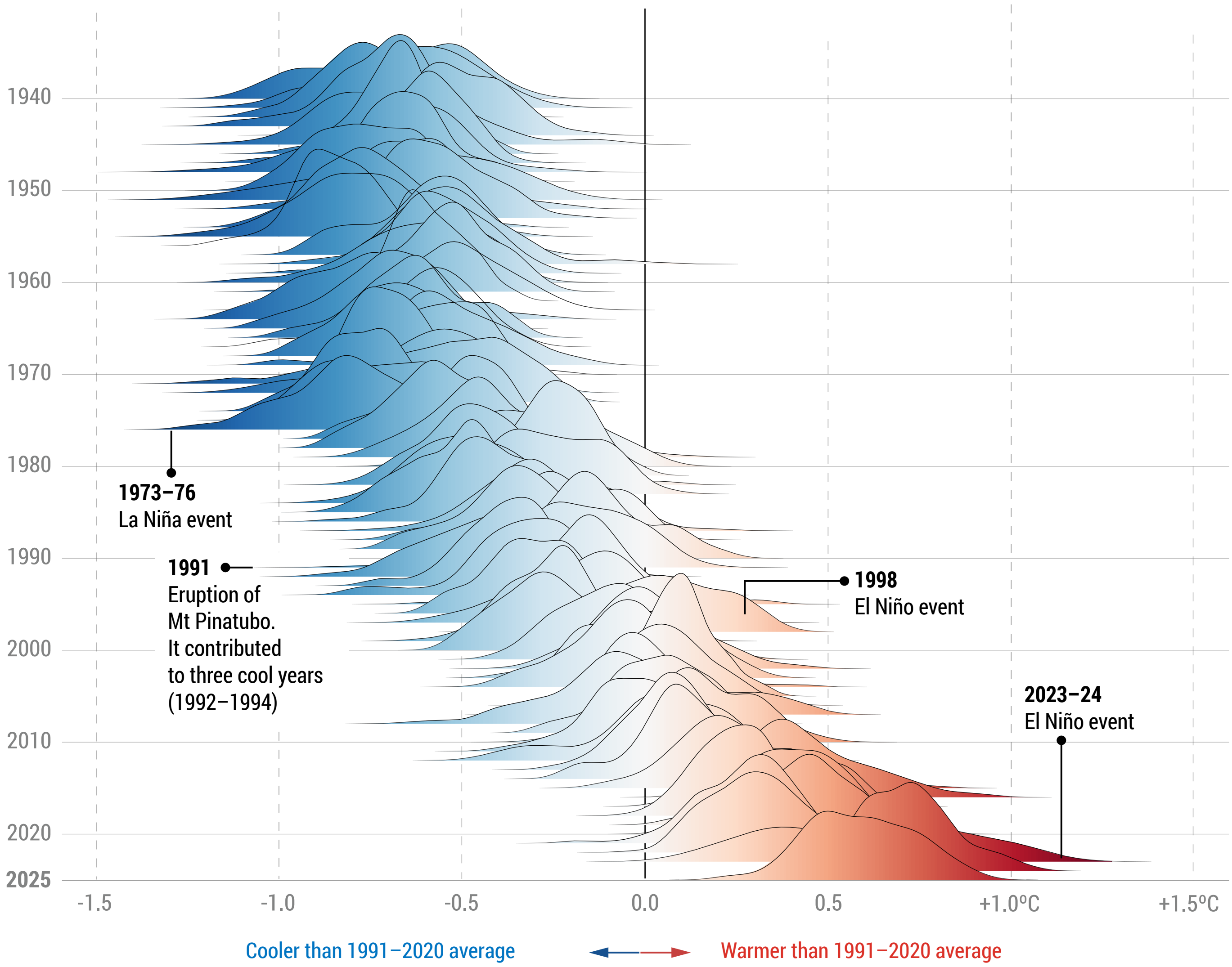
List of figures

To explore all visuals (including supplementary figures) and download the associated datasets, please visit the GCH2025 Graphics Gallery online.

To explore details on data, analysis the methods followed, please visit the About the data and methods section online.

2025 continues the shift towards higher global temperatures

Distribution of daily global surface air temperature anomalies (°C) from 1940 to 2025



*The height of each curve is proportional to the number of days experiencing a given temperature anomaly

Data: ERA5 • Reference period: 1991-2020 • Credit: C3S/ECMWF

Figure 1. Distribution of daily global average surface air temperature anomalies (°C) relative to 1991–2020 for each year from 1940 to 2025. Selected important climate events have been annotated.

Data source: ERA5. Credit: C3S/ECMWF. Visualisation inspired by the work of Erwan Rivault (BBC).

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

Key temperature statistics for 2025

Region	Anomaly (vs 1991-2020)	Actual temperature	Rank	Three highest anomalies
		Surface air temperature		
Globe	+0.59°C (+1.47°C vs pre-industrial)	14.97°C	3rd highest	2024: +0.72°C 2023: +0.60°C **2025**: +0.59°C
Global land	+0.86°C	10.08°C	2nd highest	2024: +1.06°C **2025**: +0.86°C 2023: +0.85°C
Europe	+1.17°C	10.41°C	3rd highest	2024: +1.47°C 2020: +1.19°C **2025**: +1.17°C
		Sea surface temperature		
Extra-polar ocean	+0.38°C	20.73°C	3rd highest	2024: +0.51°C 2023: +0.45°C **2025**: +0.38°C

Find more about data, definitions and methods in the About the data and methods.The C3S European region is defined as 25°W-40°E, 340-72°N.
The extra-polar ocean region is defined as 60°N-60°S. Data source: ERA5 • Credit: C3S/ECMWF

Figure 2. Key temperature statistics for 2025. The estimates for the globe refer to the average surface air temperature over land and ocean, and for Europe over land only. The extra-polar ocean used for sea surface temperature refers to the 60°N–60°S domain. Statistics for other geographic domains are available in the Graphics Gallery.

Data source: ERA5. Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

2025: the third-warmest year on record

2025 ranks as the third-warmest year on record[1], following the unprecedented temperatures observed in 2023 and 2024. It was marginally cooler than 2023, while 2024 remains the warmest year on record and the first year with an average temperature clearly exceeding 1.5°C above the pre-industrial level. 2025 saw exceptional near-surface air and sea surface temperatures, extreme events, including floods, heatwaves and wildfires. Preliminary data[2] indicate that greenhouse gas concentrations continued to increase in 2025.

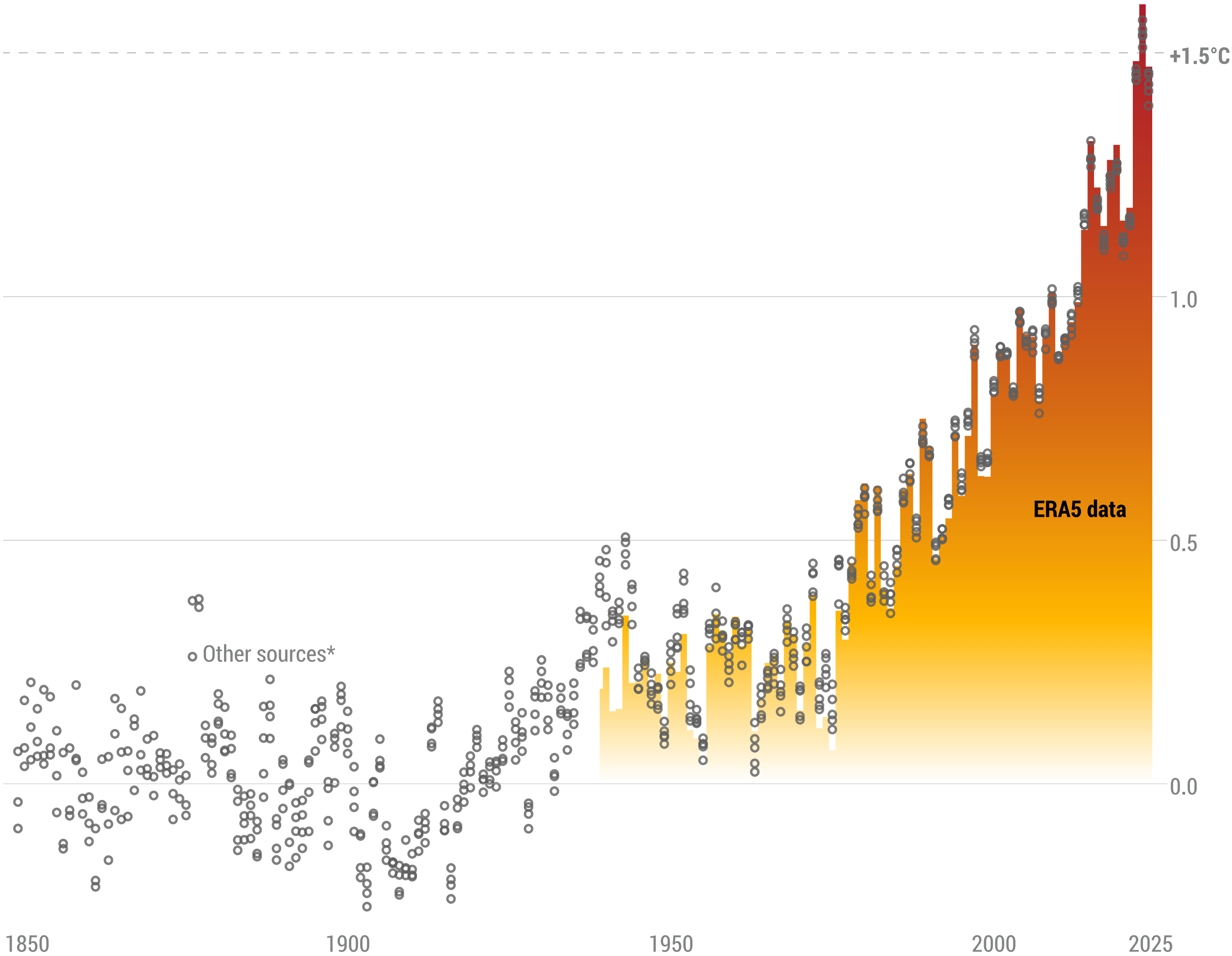
1 All findings in this report, unless otherwise stated, are based on the ERA5 global climate reanalysis dataset produced by the European Centre for Medium-Range Weather Forecasts (ECMWF) and covering the period from January 1940 to present and used for C3S' routine climate monitoring. To extend the record back to 1850 from 1940 we leverage longer global temperature records. Datasets other than ERA5 may have a slightly different ranking for 2025. The global temperatures are presented relative to the pre-industrial level, which uses an average for 1850–1900 from the IPCC 6th Assessment Report, and to a modern reference period, using the average for 1991–2020.

2 Preliminary satellite data from the Copernicus Atmosphere Monitoring Service (CAMS), show that column-averaged concentrations of carbon dioxide and methane, which reached record levels in 2024, continued to increase in 2025. An update on growth rates and concentrations of these two gases, based on consolidated estimates, will be provided in April 2026.

Exceptional heat continues to redefine climate records: first three-year average above 1.5°C

2025 was the third-warmest year on record according to ERA5

Global annual surface air temperature increase above pre-industrial level since 1850



***Other sources** comprise JRA-3Q, GISTEMPV4, NOAAGlobalTempv6, Berkeley Earth, HadCRUT5. Reference period: pre-industrial (1850-1900) • Credit: C3S/ECMWF

Figure 3. Global surface air temperature increase (°C) above the average for the 1850–1900 designated pre-industrial reference period, based on several global temperature datasets. *This figure was updated on 28 January 2026 to reflect full availability of global datasets for 2025.

Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

2025 had a global average temperature of 14.97°C, 0.59°C above the 1991-2020 average, and 0.13°C cooler than 2024, the warmest year on record. 2025 was 1.47°C above an estimate of the 1850-1900 average temperature designated to represent the pre-industrial level. This places 2025 as the third-warmest year, marginally (0.01°C) cooler than the second-warmest year 2023, according to ERA5.

2025 was also the third-warmest year on record according to the JRA-3Q reanalysis. The average temperature anomaly relative to 1850–1900 is 1.46°C for JRA-3Q, with an absolute global temperature of 14.98°C. Other centres whose global temperature datasets (Berkeley Eart, GISTEMPv4, HadCRUT5 and NOAAGlobalTempv6) are routinely monitored by C3S place 2025 as either the second- or the third-warmest year on record. These centres have 2025 between 1.39°C (HadCRUT5) and 1.45°C (GISTEMPv4) above the 1850–1900 level, assuming the same offset of 0.88°C between 1850–1900 and 1991–2020 levels as used for ERA5 and JRA-3Q[3].

While 2025 did not reach 1.5°C above the pre-industrial level, the average global temperature for 2023–2025 exceeded 1.5°C, according to the ERA5 dataset. This is the first three-year average to do so in the instrumental period. The average for those three years is 1.52°C for ERA5 and 1.50°C for JRA-3Q.

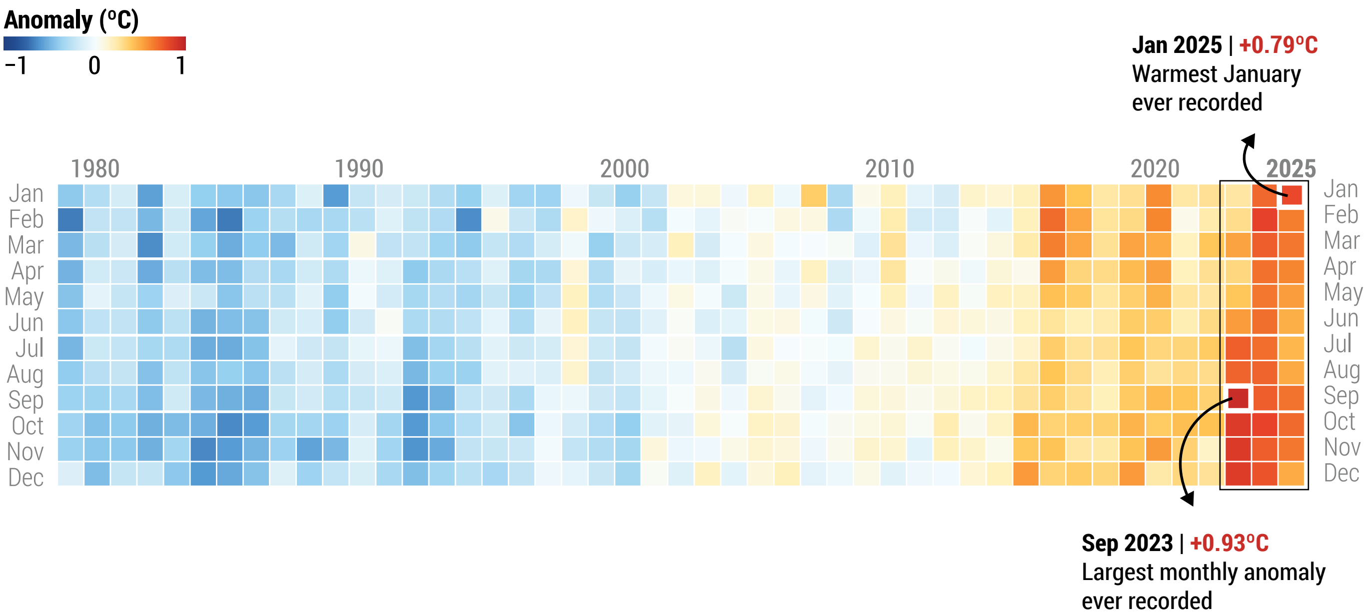
The years 2023-2025 stand out from all previous years. Therefore, 2025 will be discussed not only in the long-term context, but also alongside 2023 and 2024.

All of the past 11 years (2015–2025) rank among the 11 warmest on record. In 2025, the monthly global average temperature exceeded 1.5°C above the pre-industrial level during six months of the year, from January to April, and again in October and November. This concludes an almost continuous series of 21 months at 1.5°C above the pre-industrial level, starting in July 2023, with July 2024 as the sole exception.

3 For more information on how and why global temperature datasets differ, please see "About the data and methods".

All monthly temperature records have been broken over the past three years

Monthly global surface air temperature anomalies



Data: ERA5 • Reference period: 1991-2020 • Credit: C3S/ECMWF

Figure 4. Monthly global surface air temperature anomalies (°C) relative to 1991–2020 from January 1979 to December 2025, plotted as a heatmap.

Data source: ERA5. Credit: C3S/ECMWF.

Globally, January 2025 was the warmest January on record. March, April and May were each the second warmest for the time of year. Each month of the year, except February and December, was warmer than the corresponding month in any year before 2023.

Global temperatures for boreal winter (December 2024-February 2025) and spring (March-May) were each the second-warmest for the corresponding season, after 2024: at 0.71°C, and 0.59°C respectively above the 1991-2020 average. Boreal summer (June-August) and autumn (September-November) were third warmest for the corresponding time of the year, cooler only than 2024 (warmest summer) and 2023 (warmest autumn).

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

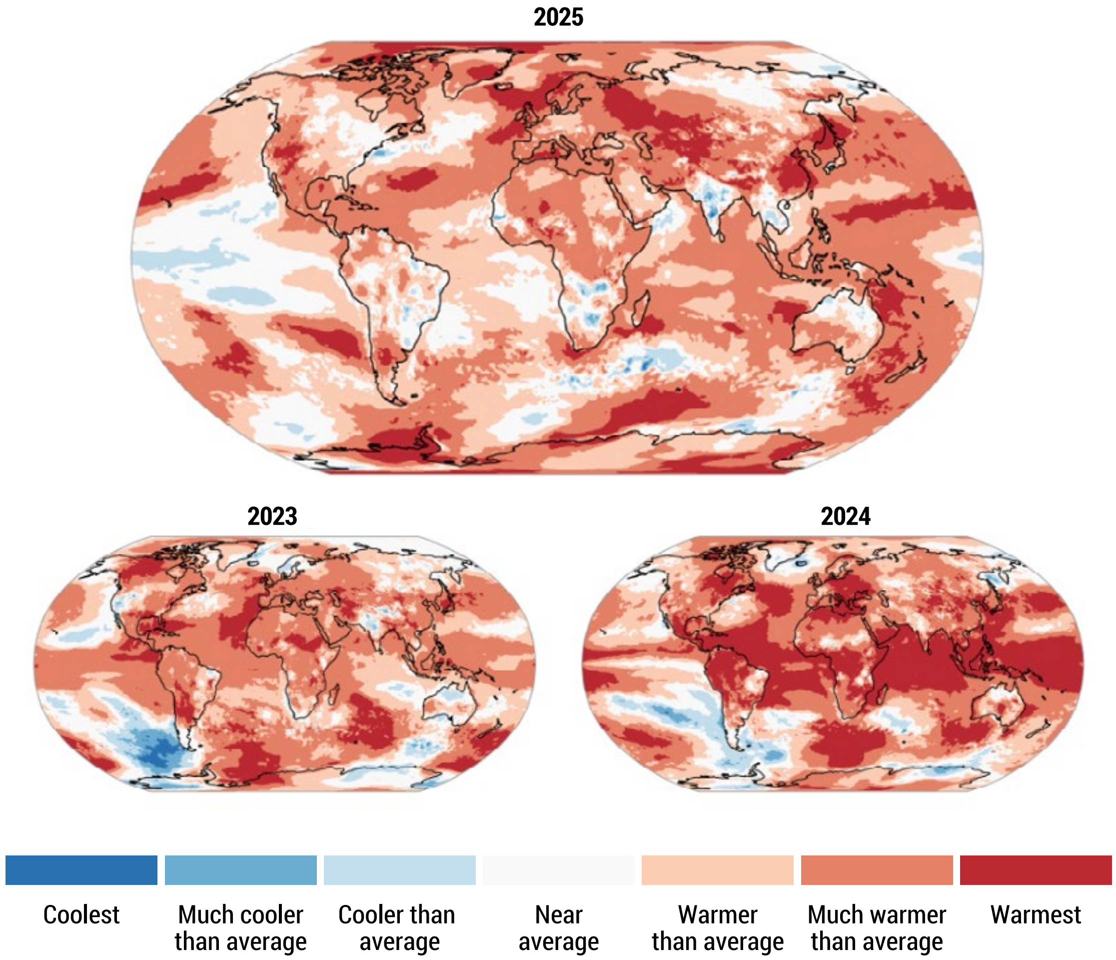
Warmer in the polar regions, cooler in the tropics

In 2025, annual surface air temperatures were above the 1991–2020 average across 91% of the globe, the same fraction as in 2024. Nearly half of the globe (48%) experienced much warmer than average annual temperatures (above the 90th percentile of the 1991–2020 climatology[4]). Annual temperatures were the warmest over 9% of the Earth's surface relative to all years since 1979 in the ERA5 dataset. These proportions were 63% (much warmer than average) and 31%[5] (warmest), respectively, in 2024. While temperatures were less extreme in 2025 than in 2024, these figures highlight the persistence of widespread warmth across the globe in 2025.

4 In the maps showing 'temperature anomalies and extremes', 'warmest' means the warmest in the dataset for its more reliable period from 1979 onwards, 'much warmer than average' means warmer than the 90th percentile of the annual temperature distribution during the 1991–2020 reference period; 'above average' means warmer than the 66.6th percentile; 'near average' means between the 33.3rd and 66.6th percentiles; 'below average' means cooler than 33.3rd percentile; 'much cooler than average' means colder than the 10th percentile, 'coolest' means the coldest in the period from 1979 onwards.

5 The fractions of the globe with record-high temperatures in 2024 reported here (for air or sea surface) are slightly lower than those quoted in the Global Climate Highlights 2024. This difference arises because record highs and lows are evaluated over the full 1979–2025 period. As a result, some areas that were classified as record-high in 2024 were surpassed by even higher temperatures in 2025, and are therefore no longer counted as record-high for 2024 when using this longer period.

Anomalies and extremes in surface air temperature



Data: ERA5 1979-2025 • Reference period: 1991-2020 • Credit: C3S/ECMWF

Figure 5. Anomalies and extremes in surface air temperature in 2025 (large map) and in 2023 and 2024 (smaller maps). Colour categories refer to the percentiles of the temperature distributions for the 1991–2020 reference period[4]. The extreme ('coolest' and 'warmest') categories are based on rankings for 1979–2025.

Data source: ERA5. Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

Land areas that were much warmer than average in 2025 included the tropical regions of the Americas, northeastern Canada, large parts of Africa, the Maritime Continent, large parts of Europe and extratropical Asia, as well as most of Greenland and Antarctica. Annual air temperatures over land reached record highs over the western United States, eastern Greenland, northern Europe, western Russia, central Asia, eastern China, and Antarctica. The annual air temperature averaged over all global land areas was the second warmest on record, at 0.86°C above average, 0.20°C cooler than the record set in 2024 and 0.01°C warmer than in 2023.

Cooler-than-average to much cooler-than-average land regions in 2025 included eastern South America, parts of westernmost and southern Africa, most of India, parts of southeast Asia and far-eastern Russia. The cooler-than-average air temperatures over the tropical Pacific reflected patterns in sea surface temperature (SST) associated with neutral El Niño Southern Oscillation (ENSO) or La Niña conditions[6]. SST conditions in 2025 are discussed in more detail in the **Sea surface temperatures** section.

Temperature anomalies, relative to the 1991–2020 period, averaged over five latitude bands provide further insight into long-term warming trends across the globe, as well as notable regional differences in 2025 compared with 2023 and 2024. All regions show a clear long-term warming trend, although variability is larger in the Antarctic region.

In the tropics, the temperature anomaly in 2025 (+0.29°C) was lower than in 2023 (+0.53°C) and 2024 (+0.68°C). This reflects the persistence of neutral ENSO conditions or periods of weak La Niña throughout 2025, in contrast to the strong El Niño event that influenced parts of 2023 and 2024. Less extreme temperatures in the tropical Atlantic and Indian Oceans also contributed.

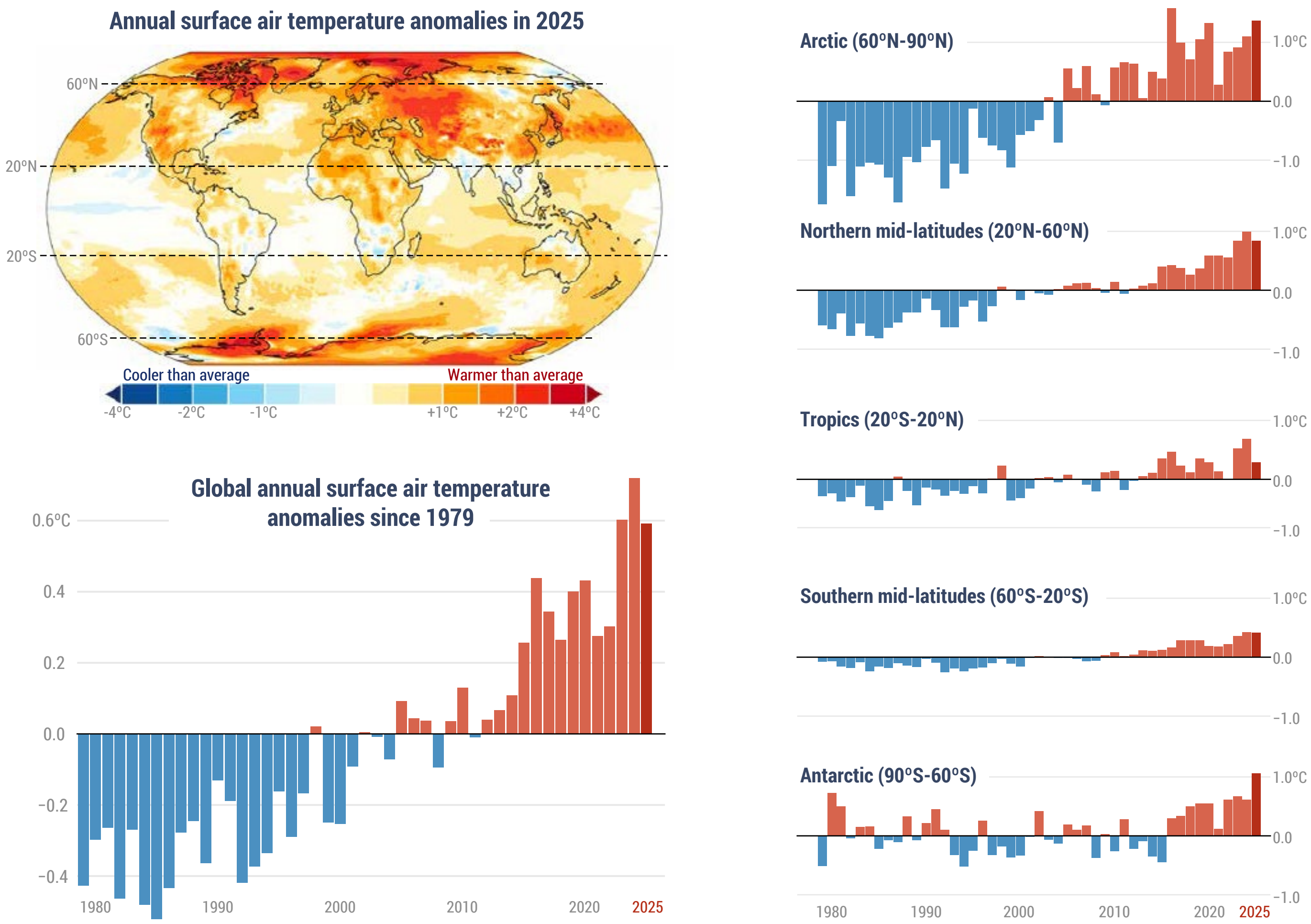
In the northern mid-latitudes, the temperature anomaly in 2025 (+0.84°C) was lower than in 2024 (+0.99°C) but identical to the value observed in 2023. Both 2023 and 2025 ranked as the second-highest years on record for this region. In contrast, temperature anomalies in the polar regions were notably high. This was particularly evident in the Antarctic region, where the anomaly (+1.06°C) reached a record high in 2025. In the Arctic, the anomaly (+1.37°C) was the second-highest on record, behind 2016 (+1.59°C).

In the southern mid-latitudes, the temperature anomaly in 2025 (+0.42°C) was the same as in behind 2016, with both years jointly ranking as the warmest on record for the region.

This regional breakdown of temperature anomalies shows that the lower anomaly in the tropics reduced the global average in 2025, while record or near-record warmth in most other regions partly offset this effect, resulting in 2025 being only 0.01°C cooler than 2023 globally.

6 El Niño Southern Oscillation (ENSO) is a natural climate pattern that involves periods of warmer-than-average (El Niño) or cooler-than-average (La Niña) sea surface temperatures (SSTs) in the central and eastern tropical Pacific. Periods when SSTs are close to average are referred to as 'ENSO-neutral' or 'neutral ENSO conditions'.

2025 saw higher temperatures in the polar regions



Data: ERA5 • Reference period: 1991-2020 • Credit: C3S/ECMWF

Figure 6. (Top left) Map of annual surface air temperature anomalies in 2025. (Bottom left) Time series of global annual temperature anomalies from 1979 to 2025. (Right) Time series of annual temperature anomalies averaged over five latitude bands from 1979 to 2025. All anomalies are calculated relative to the average for the 1991–2020 reference period.

Data source: ERA5.Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

The third-warmest year for Europe

For Europe, 2025 was the third-warmest year on record, with an average temperature of 10.41°C, 1.17°C above the average for the 1991-2020 reference period. This was 0.30°C below the record of 2024 (1.47°C above average) and only 0.02°C cooler than the value for 2020 (1.19°C above average), the second-warmest year. Only one month of the year, March, was the warmest for Europe, with an average temperature of 6.03°C, 2.41°C above the 1991-2020 average for March, 0.26°C warmer than the previous warmest March in 2014.

Winter 2025 (December 2024 to February 2025) was the joint second warmest for the season, at 1.46°C above the 1991-2020 average, significantly cooler than the warmest European winter in 2020 (2.84°C above average).

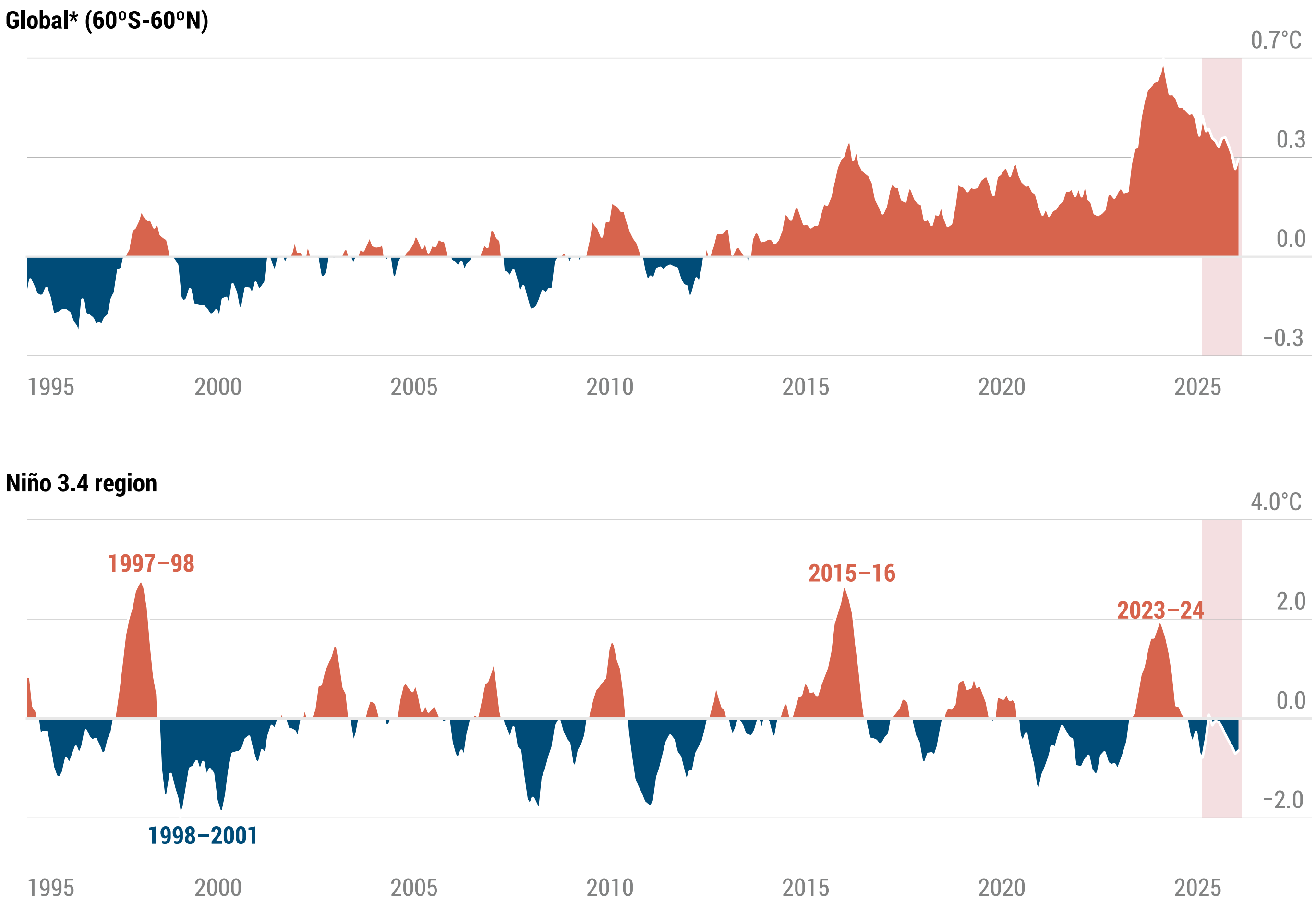
For the year as a whole, temperatures were above average across Europe and much above average in most regions, with the exception of central parts of the continent. The eastern north Atlantic, the North Sea region including northern Britain and parts of Scandinavia, the southwestern Mediterranean, and westernmost Russia saw record-warm temperatures.

Sea surface temperature

Sea surface temperatures remained high, despite ENSO-neutral conditions

Sea surface temperature remained high throughout 2025, despite the absence of El Niño conditions

Monthly sea surface temperature anomalies relative to 1991-2020



*Excluding polar region. Data source: ERA5 • Credit: C3S/ECMWF

Figure 7. Monthly sea surface temperature (SST) anomalies averaged over the extra-polar ocean (60°S–60°N; top) and over the Niño 3.4 region (5°N–5°S, 170°–120°W; bottom) in the equatorial Pacific. Anomalies are relative to the monthly averages for the 1991–2020 reference period for the corresponding month.

Data source: ERA5. Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

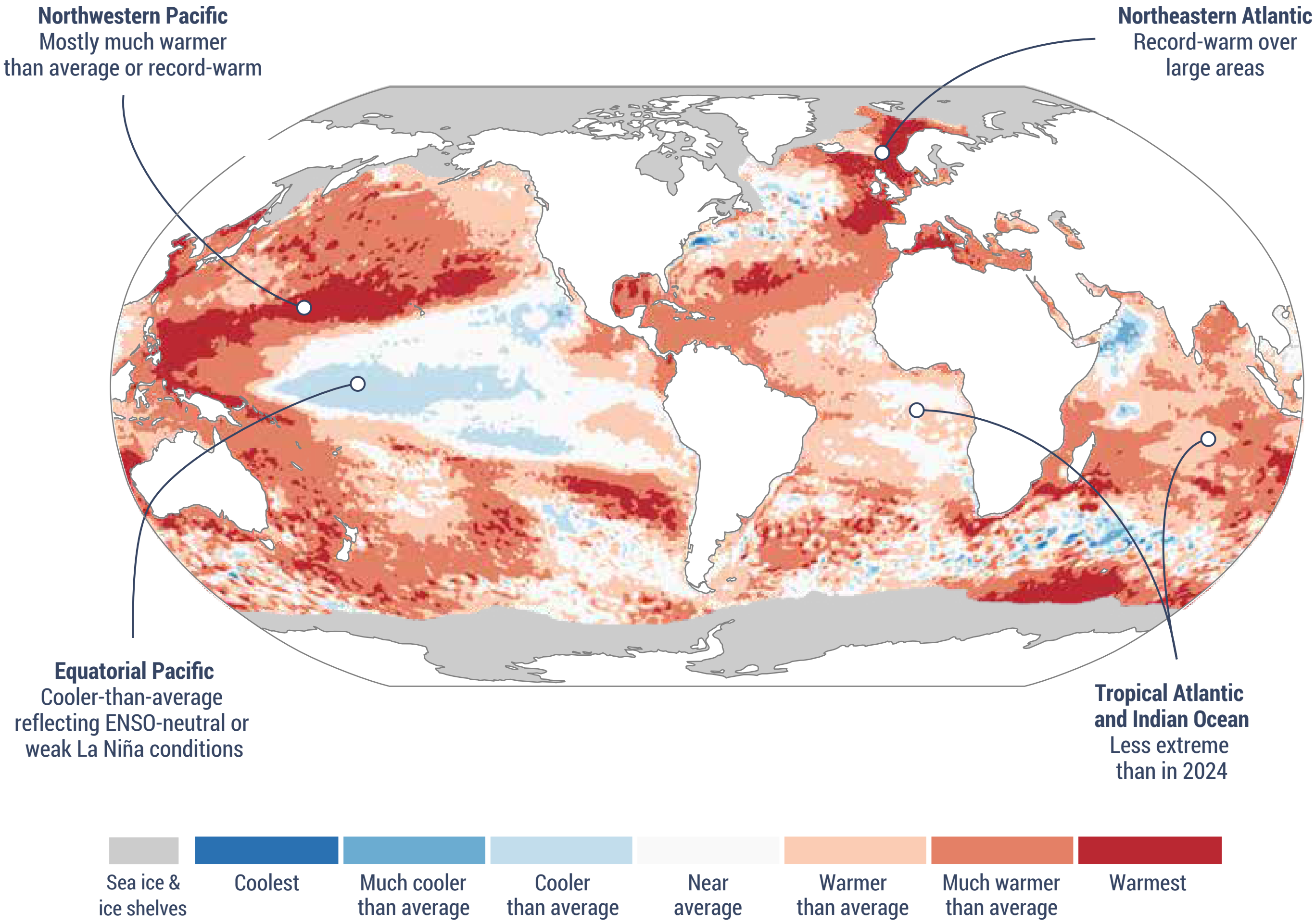
The sea surface temperature (SST) averaged over the extrapolar oceans (60°S–60°N) remained historically high throughout 2025, despite the absence of El Niño conditions. This contrasts with 2023 and 2024, when a strong El Niño event influenced SSTs for several months of the second half of 2023, peaking in December 2023, with SSTs remaining high throughout 2024 and the average SST reaching record highs. The annual average SST for 2025 was 20.73°C, 0.38°C above the 1991–2020 average. It ranked as the third-highest on record, 0.13°C below the record set in 2024 and 0.07°C below 2023, the second-highest year. This makes 2025 the warmest La Niña year on record both in terms of global air temperature and SST.

At the monthly scale, the average SST was the second warmest on record for the time of year from January to May (behind 2024), the third warmest from June to October (behind 2023 and 2024), and the fourth warmest in November and December (behind 2023, 2024, and 2015, which was also influenced by a strong El Niño event). In the equatorial Pacific, SSTs were cooler than average early in the year, reflecting a short-lived, weak La Niña event in December 2024 and January 2025. Neutral ENSO conditions prevailed from March to July. Cooler-than-average SSTs developed again from August, leading to a return to weak La Niña conditions in October that persisted until the end of the year.

The annual SST anomalies for 2025 show a pattern consistent with La Niña–like conditions, with near-average to cooler-than-average SSTs across much of the eastern and central tropical Pacific. Apart from limited regions with cooler-than-average SSTs in the northwestern and southern Indian Ocean, the northeastern North Atlantic, and the southeastern Pacific, SSTs were above average across most of the world's oceans. About 9% of the extrapolar oceans experienced record-high annual SSTs, substantially less than in 2024 (25%[4]), mainly because of less extreme SSTs in the tropical Atlantic and Indian Oceans than in the previous year. In 2025, record-high SSTs were mainly found in the western and northwestern Pacific, the Indian Ocean sector of the Southern Ocean, the northeastern North Atlantic and adjacent North Sea, Norwegian Sea and Barents Sea, as well as parts of the western Mediterranean Sea. Beyond record values, SSTs were much warmer than average (above the 90th percentile of the climatology) over 42% of the extrapolar oceans, compared to 59% in 2024, underscoring the continued widespread warmth of the surface oceans.

A notable feature of 2025 SSTs was the record warmth across large parts of the western North Pacific. Several factors are known to have contributed to the exceptional warmth of the world's oceans since 2023 (see **How exceptional were the past three years?** section below). At the same time, the warm SST pattern across the western North Pacific observed in 2025 is consistent with the combination of La Niña conditions and a negative phase of the Pacific Decadal Oscillation (PDO) that characterised much of the year. This combination is known to favour warm SST anomalies in this ocean basin. The high SSTs also represent the continuation of a marked warming of the North Pacific since around 2013–2014, which has been linked in part to changes in ocean mixed-layer depth.

Anomalies and extremes in sea surface temperature in 2025



Data: ERA5 1979-2025 • Reference period: 1991-2020 • Credit: C3S/ECMWF

Figure 8. Anomalies and extremes in sea surface temperature for 2025. Colour categories refer to the percentiles of the temperature distributions for the 1991–2020 reference period. The extreme ('coolest' and 'warmest') categories are based on rankings for the period 1979–2025. Values are calculated only for the ice-free oceans.

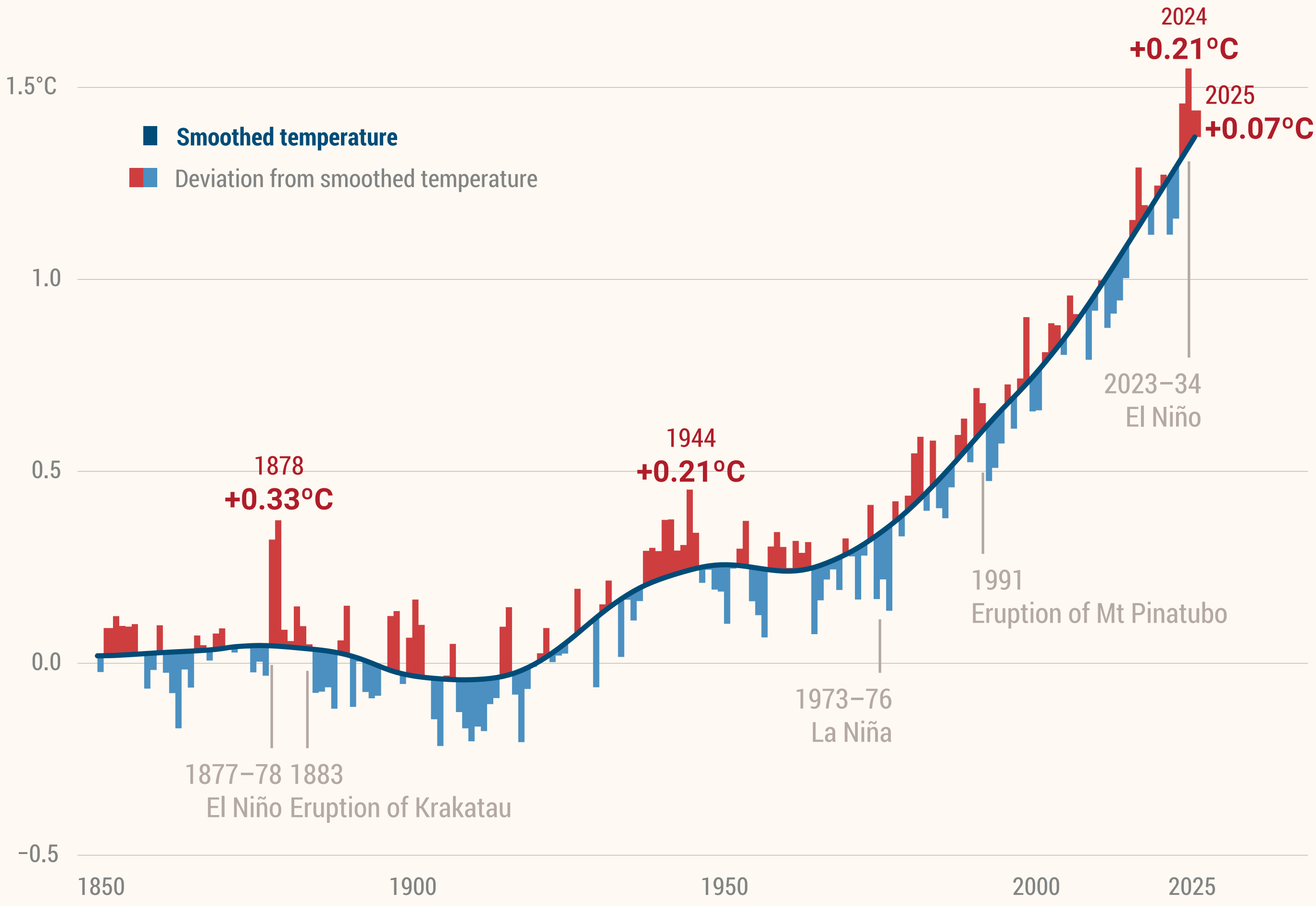
Data source: ERA5. Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

How exceptional were the past three years?

Comparing current conditions with a climatology based on a moving average, rather than the traditional fixed 30-year average, can be used to investigate anomalous events in a changing climate. Against an evolving background climatological state, annual anomalies are more easily identified.

By how much do annual global temperatures deviate from evolving climatological averages?



Only a sample of some of the most important natural events are highlighted.

Data: average of Berkeley Earth, ERA5, GISTEMPV4, HadCRUT5, JRA-3Q, NOAAGlobalTempv6 • Reference period: pre-industrial (1850-1900) • Credit: C3S/ECMWF

Figure 9. Difference in global-average temperature (°C) from the designated pre-industrial (1850–1900) level, based on the averages of monthly values from up to six datasets: Berkeley Earth, HadCRUT5 and NOAAGlobalTemp (from 1850), GISTEMP (from 1880), ERA5 (from 1940) and JRA-3Q (from September 1947). Datasets are normalised to have the same averages for 1991–2020 and an average offset of 0.88°C is used to relate 1991–2020 and 1850–1900 averages. The black curve shows an estimate of the long-term climatological variation of temperature (see About the data and methods). The red and blue bars show the deviations of annual-average temperatures from this estimate. *This figure was updated on 28 January 2026 to reflect full availability of global datasets for 2025.

Credit: C3S/ECMWF.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

Figure 9 illustrates this approach for global-mean temperatures averaged over multiple datasets. It shows that only two years were much warmer than 2024 when compared to the climatological state at the time: 1877 and 1878. These were during the 'Great Drought' of 1875 to 1878, when it is estimated that around 50 million people died in India, China and parts of Africa and South America. This period was characterised by both a strong El Niño in the tropical Pacific and unusually warm SSTs elsewhere, although gaps in data coverage prevent a full comparison with recent events.

Aside from 1876-78 and 1877-79, the period 2023-2025 is, jointly with 1899-1901, the warmest period of three consecutive years relative to the evolving climate. A strong El Niño occurred again in 1899-1900, and the period also saw a further major famine in India. The next two warmest three-year periods occurred during the spell of extended global warmth that occurred from 1937 to 1945[7].

Figure 9 also shows that the warming rate of the background climatological state increases from the late 1970s to the present day. It accelerates from 0.18°C per decade at the mid-point of the thirty-year period 1979–2008 to 0.25°C per decade at the end of 2025. The evolving climate warms to 1.38°C above its 1850-1900 average by the end of 2025. The dataset-average temperature anomaly for 2025 is only 0.02C smaller than that for 2023 when measured relative to the 1991-2020 average, but 0.07°C smaller when measured relative to the evolving climate.

7 *There is evidence that the sea surface temperature analyses for the early 1940s used here are biased warm, but surface air temperatures averaged only over land for 1938 and 1944 are higher than for any other year prior to 1973.*

What factors were behind the warmth of 2023-2025?

The 2023/24 El Niño was a strong but not exceptional example of this naturally occurring phenomenon, having a peak Oceanic Niño Index of 2.0°C, which is smaller than the peaks of the 2015–2016, 1997–1998 and 1982–1983[8] events. Aside from the El Niño, a significant fraction of the additional warmth of the atmosphere in the last three years has been shown to originate from SSTs across oceanic regions other than the tropical Pacific. 2024 and 2025 were also slower to move from El Niño towards neutral and then weak La Niña conditions than is often the case.

The last three years thus appear to be exceptionally warm because of two main factors. The first is accelerating human-induced climate warming. This is partly due to a faster build-up of greenhouse gases in the atmosphere, from continued emissions and reduced uptake of carbon dioxide by natural land and ocean sinks, and partly due to reduced cooling by aerosols, including from lower aerosol emissions from East Asia since 2010. Secondly, sea surface temperatures reached exceptionally high levels across the ocean, associated with an El Niño event and other types of ocean variability, amplified by climate change. This includes the Pacific Decadal Oscillation discussed in the **Sea surface temperature section**. Other factors may also have had an influence on air temperatures over the last three years, either directly or by enhancing the SST anomalies. They include:

- Atmospheric circulation anomalies – changing cloud amounts, air-sea interaction and upper-ocean mixing.
- Lower sulphur dioxide emissions by shipping – warming due to an additional reduction in aerosols.
- Reduced amounts of low-level cloud – warming of the climate system from increased absorption of solar radiation, due in part to a weakening effect of aerosols on clouds
- Solar cycle maximum – warming from increased solar energy reaching Earth.
- Temperature/water-vapour feedback – warming from the enhanced greenhouse effect of additional water vapour in the atmosphere.

8 *Warming of the global atmosphere in this case was offset by cooling due to the volcanic eruption of El Chichón.*

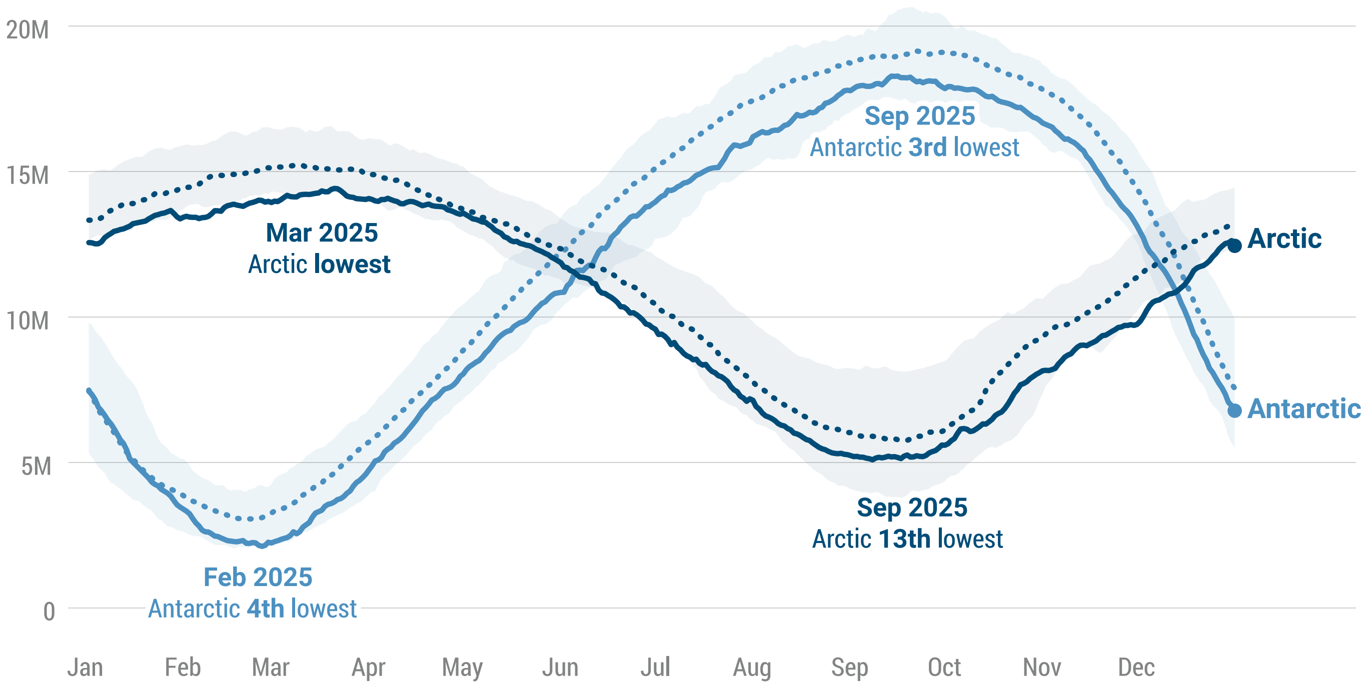
Sea ice

Continuing near-record sea ice lows in Arctic and Antarctic

In the Arctic, the monthly sea ice extent began reaching record lows for the time of year in December 2024 and remained at record-low levels through the first three months of 2025. The annual maximum in March was the lowest in the 47-year satellite record. Monthly extents were less extreme from April to August, although they still remained well below average, ranking between second and ninth lowest for their respective months. At its annual minimum in September, the extent was further from record-low values, ranking 13th lowest for the month (the minimum in daily extent ranked 14th lowest). Later in the autumn, however, the extent again approached historically low levels, ranking second lowest for the time of year in November and lowest for December.

February 2025 saw lowest global extent of sea ice

Daily sea ice extent in both polar region



Data in square kilometres. Dotted lines show the 1991-2020 median values, the shaded areas illustrate the value range between 1979 and 2024. Rankings are based on monthly sea ice extents. Data: **OSI SAF Sea Ice Index v2.3** • Credit: C3S/ECMWF/EUMETSA

Figure 10. Daily Arctic and Antarctic sea ice extent from 1 January 1979 to 31 December 2025. 2025 is shown with a dark blue solid line (Arctic) and light blue solid line (Antarctic).

Data source: EUMETSAT OSI SAF Sea Ice Index v2.3. Credit: C3S/ECMWF/EUMETSAT.

Around Antarctica, 2025 began with a near-average sea ice extent in January, in contrast to the record or near-record lows observed through most of 2023 and 2024. The situation changed in February, when the extent reached its fourth-lowest annual minimum (the minimum in daily extent ranked second lowest). For the rest of the year, Antarctic sea ice remained well below average, with monthly rankings generally between third and fifth lowest, except in April, which ranked tenth lowest. The annual maximum in September was the third lowest in the satellite record.

In February, the combination of record-low Arctic sea ice extent for the time of year and much-below-average Antarctic extent at its annual minimum resulted in the lowest global sea ice cover for any month since the beginning of satellite observations in the late 1970s.

← See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

A world of extreme events

Extreme events in 2025[9] had significant impacts on human health, ecosystems and infrastructure. Among the most exceptional events were flooding, extreme heat, drought, and wildfires.

Flash floods were caused by intense, and in some cases record, precipitation (for example in the USA in February, and in China, South Korea, Pakistan, the USA and India during boreal summer) or by glacier melting (including three glacial-origin floods in May and June, in Nepal, Afghanistan and Pakistan, and two in July in Nepal).

There was also larger-scale flooding due to the passage of atmospheric rivers (such as in the Pacific Northwest in December), monsoon rainfall (in South and Southeast Asia during the wet seasons), large low-pressure systems (e.g Australia in the austral late summer and autumn), and tropical cyclones.

Provisional data from NOAA IBTrACS indicate that 2025 saw 103 tropical storms, of which 50 became tropical cyclone strength and 20 became major tropical cyclones. Many of these storms affected populations and infrastructure around the world.

9 The list of events included in this report provides some examples from across the globe, but is not exhaustive. Please refer to resources such as the WMO State of the Climate Update for COP30 and regional and national reporting for more detailed information.

Among others, tropical cyclones that resulted in flooding around the world in 2025 included: Cyclone Dikeledi, Madagascar (January); Cyclone Zelia, Australia; Intense Tropical Cyclone Garance, Réunion Island and Mauritius; Tropical Cyclone Alfred, Australia (February); Tropical Cyclone Jude, Madagascar and Mozambique (March); Bay of Bengal tropical depression 01, Bangladesh, India, Myanmar (May); Tropical Storm Wutip, China, Vietnam and the Philippines; Hurricane Erick, Mexico; Tropical Storm Barry, Mexico and USA (June); Typhoon Danas, Philippines, Taiwan, China; Tropical Storm Chantal, USA (July); Hurricane Erin, Lesser Antilles (August); Typhoon Ragasa/Nando, southern Asia (September); Typhoon Halong, Japan, the Aleutians, and Alaska; Hurricane Melissa, the strongest tropical cyclone of 2025 globally, the Caribbean, Bermuda and Canada (October); Typhoon Kalmaegi, Philippines and Vietnam; Typhoon Fung-wong/Uwan, Philippines, Taiwan and Japan (November); Cyclone Fina, Australia; Cyclonic Storm Senyar, Malaysia, Indonesia and Thailand (November); Cyclone Ditwah, India and Sri Lanka (November/December).

Europe was impacted throughout the year by a range of storms and precipitation events, from convective storms to named storms, often associated with flooding. Estimates suggest around 40 named storms occurred during 2025[10]. Examples include Storm Éowyn, which hit Ireland, the UK and western Scandinavia in January; Storm Amy (Detlef), which impacted western and northern Europe; Storm Barbara, which brought record-breaking rainfall to Romania and Greece in October, storm Claudia and storm Emilia, which affected western Europe in November and December, respectively.

During 2025, there were numerous heatwaves, often breaking national or local temperature records. Significant heatwaves occurred across Asia, North America, Africa and Europe.

In Asia, the regions affected during spring and summer included India and Pakistan, parts of Central Asia, as well as Japan and South Korea. North America also saw severe summer heatwaves. In Africa, countries in the Sahel saw temperatures significantly above average, particularly in February and early spring.

Europe experienced multiple heatwaves from April to September, particularly affecting Italy, Spain, Germany, France, and the UK. Scandinavia and Finland also saw persistently above-average temperatures in July. Some monthly and summer records were broken at local and national level, including in the UK, Ireland, Spain, Portugal and Türkiye. Some regions across the continent experienced a combination of persistent above-average temperatures and marine heatwaves[11].

Several regions saw a prolonged lack of precipitation, often coinciding with high temperatures, including parts of North and South America, southern and eastern Africa, regions of the Mediterranean, northwestern and eastern Europe, the Middle East, and parts of Southeast Asia.

Heatwaves and dry conditions, often accompanied by strong winds, favoured the spread and intensification of wildfires in several regions across the globe. According to Copernicus Atmosphere Monitoring Service (CAMS) annual review on wildfire emissions in 2025, Europe and North America were among the most affected regions. The Iberian Peninsula, Scotland, the eastern Mediterranean, and the Balkan region suffered from severe wildfires throughout the summer, leading to the highest annual total fire emissions in Europe[12] in the past two decades. Extreme wildfires also persisted across boreal regions of North America. Canada recorded its second highest annual wildfire emissions, while the USA saw a major wildfire outbreak in California in January, following a wetter-than-usual spring and an exceptionally dry autumn and early winter, which resulted in an abundance of highly flammable vegetation. Russia's far east, Syria and Australia also saw significant wildfire activity during their respective spring or summer seasons, leading to local emission records, according to CAMS.

10 2025–26 European windstorm season and 2024–25_European_windstorm_season (*last accessed 07/01/2026)*

11 See also the C3S web article on European summer 2025 - hot in the west and south, dry in the southeast.

12 This definition of Europe encompasses the European Union and the UK.

More heat stress than average over half of the globe

In 2025, 50% of the globe (land areas; excluding Antarctica) experienced more days than average with at least strong heat stress (a feels-like temperature of 32°C or above). In some regions, such as parts of southern USA and eastern Asia, there were up to 45 more days with at least strong heat stress than average, while central Africa saw up to around 110 more days with very strong heat stress (38°C or above). In 2025, some regions, such as most of Australia, parts of northern Africa and the Arabian Peninsula, saw more extreme heat stress days than average. Up to a third of the globe, including regions such as southern Africa and southern Asia, saw fewer heat stress days than average.

Half of the globe experienced more days than average with at least strong heat stress in 2025

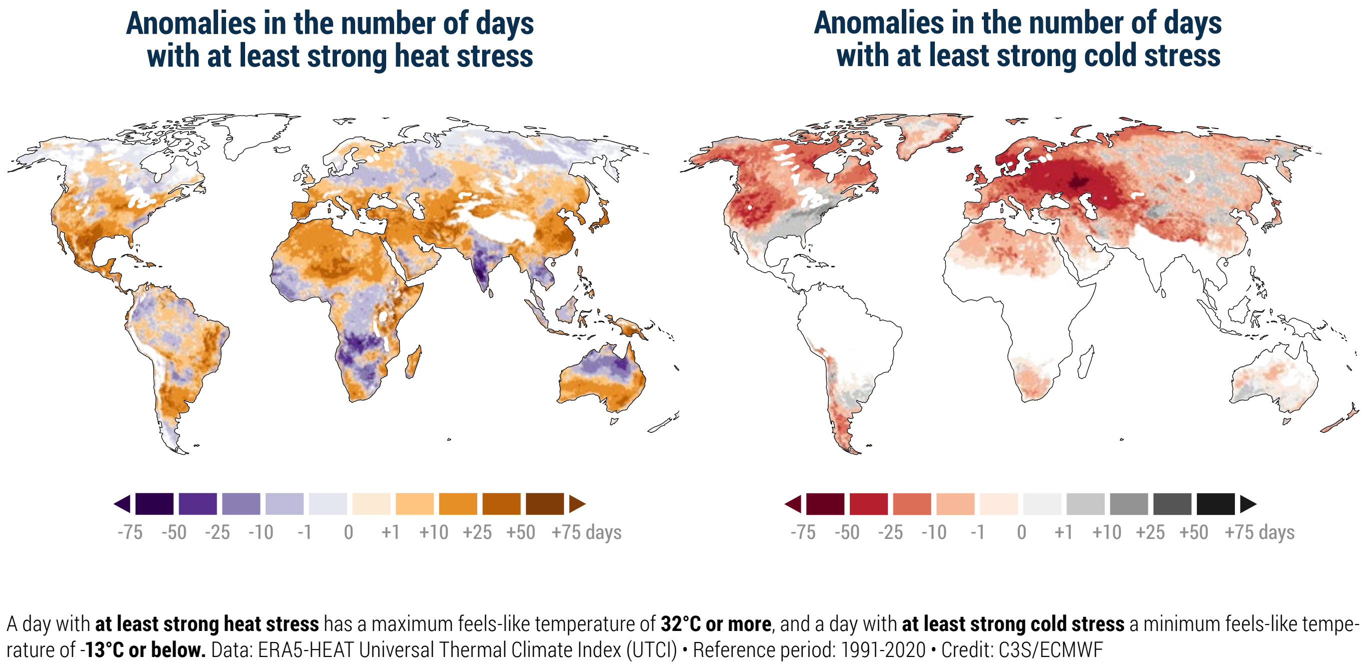


Figure 11. Anomalies in the number of days in 2025 with at least strong heat stress (left) and at least strong cold stress (right), relative to the average for the 1991–2020 reference period. A day with at least strong heat stress has a maximum feels-like temperature, based on the Universal Thermal Climate Index (UTCI), of 32°C or more, and a day with at least strong cold stress has a minimum feels-like temperature of -13°C or below.

Data source: ERA5-HEAT. Credit: C3S/ECMWF.

14% of the globe experienced more days than average with at least strong cold stress (a feels-like temperature of -13°C or below) in 2025. This is typically up to 10 days more than average, and includes an area covering parts of Argentina, Uruguay and southern Brazil, where notable cold conditions occurred in late June and early July for example, alongside southern USA and southwestern Australia. In northwestern USA, some areas saw up to 25 more days with at least strong cold stress, and parts of northern USA and Canada also saw more days than average with very strong or extreme cold stress. Meanwhile, up to 71% of the globe saw fewer days with cold stress than average. Most notably, the region north of the Caspian Sea saw up to 60 fewer days with at least strong cold stress than average, southern Scandinavia up to 45 fewer, and Iceland and parts of the USA and Canada up to around 30 fewer.

See the chart online.
You can explore our online graphics gallery for an interactive version and to access the data behind it.

Long-term trends in climate indicators

While this report explores the climate highlights of 2025, the C3S 'Climate Indicators' provide the underlying context in terms of long-term trends at global and regional levels in a changing climate.

Here is a summary of some of the most relevant aspects from their most recent update, released as part of the European State of the Climate 2024.

- In recent decades, temperatures over land have risen around twice as fast as those over the ocean.
- Europe is the fastest-warming of all the WMO regions, at around twice the global average.
- Arctic temperatures have risen more rapidly than those in the rest of the globe, with an estimated warming of around 3°C since the 1970s.
- Since the 1980s, global sea surface temperatures (extra-polar ocean, 60°S–60°N) have seen an increase of around +0.6°C, European Seas of around +1.0°C, the Mediterranean Sea of around +1.3°C
- Since 2020, atmospheric concentrations of the two most important anthropogenic greenhouse gases, carbon dioxide (CO_2) and methane (CH_4), have seen an annual increase of approximately 2.4 ppm and 12 ppb, respectively.

For the most recent updates on the long-term evolution of additional key climate indicators, including sea level, ocean heat content, glacier ice, ice sheet and sea ice loss and greenhouse gas fluxes, please visit the C3S 'Climate Indicators' dashboard.

Paris Agreement targets - where are we now and where are we going?

Where are we now?

By the end of 2025 the globe has warmed by about:

+1.4°C above the pre-industrial level

This number is based on **three separate methods** that use C3S data and calculations following those illustrated in the WMO Global State of the Climate 2024

When will we reach +1.5°C?

If warming continues at the same rate as in the last 30 years, the globe could be at:

approximately +1.5°C by

the end of this decade

Estimate based on the method behind the **C3S global trend monitor.**

The UNFCCC Paris Agreement, adopted ten years ago, aims at "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels". While the Agreement does not specify exactly how these levels are defined, there is consensus that they refer to long-term global surface temperature change, with the current level being typically referred to as 'current global surface warming level' and pre-industrial referring to the 1850-1900 level. There are ongoing community efforts aiming to propose which methods to use to define the current global surface warming level and, as a consequence, how far we are from breaching those limits.

A brief overview of four classes of methods under discussion is given by the WMO Global State of the Climate report for 2024[13].

13 More detail in the About the data and methods

Where are we now?

C3S provides regular monitoring of the 'current global surface warming level' using three methods[14]. By the end of 2025, all three indicate a current global surface warming level of about 1.4°C above the pre-industrial level.

Where are we going?

One year or two years seeing global surface air temperatures above 1.5°C does not mean that the first Paris Agreement level has been breached. However, for the first time, the latest three-year average is above 1.5°C according to ERA5, highlighting that the world is getting closer to this level.

A Met Office forecast issued late in 2024 correctly indicated that it was likely that 2025 would become the third, or even second, warmest year on record globally. The corresponding forecast for 2026 is for a fourth consecutive year with an average temperature more than 1.4°C above the average for 1850-1900, with the temperature for 2026 likely falling below that of 2024, but close to that of 2023 and 2025.

The WMO Global Annual to Decadal Climate Update for 2025-2029 released in June 2025 reported an 80% chance that at least one of these five years would replace 2024 as the warmest year on record, and an 86% chance that at least one of the years would, like 2024, be more than 1.5°C above the 1850-1900 average. It also identified a 70% chance that the five-year average warming for 2025-2029 would be more than 1.5°C above the 1850-1900 level.

The C3S global trend monitor, which assumes a continuation of the rate of warming over the last 30 years, updated at the end of 2025, indicates a crossing of the 1.5°C level in 2029. This estimate falls within, but in the early part of, the time interval for a possible breaching of the 1.5°C level given by the 'likely' estimate from the IPCC 1.5 degree report and roughly corresponds to the central estimate of the 'early 2030s' as assessed in the IPCC AR6 report.

14 The three methods are: 1. The average of the last-five years (1.38°C, see Figure Graphics Gallery), 2. the December 2025 estimate from the Global trend monitor (1.41°C), 3. the December 2025 estimate from the LOESS-filter smoothing (1.38°C, see Figure 10). Note, methods 1 and 2 are based on ERA5 only, while method 3 is a central estimate based on several datasets. There is additional uncertainty in the numbers associated with the definition of the pre-industrial and with dataset spread.

PROGRAMME OF THE EUROPEAN UNION

Copernicus Europe's eyes on Earth

Climate Change Service climate.copernicus.eu

Atmosphere Monitoring Service atmosphere.copernicus.eu

IMPLEMENTED BY ECMWF