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**Press Release**

**January 12th, 2023**

### **Berkeley Earth Global Temperature Report: 2023 Was the Warmest Year on Record**

*Berkeley, California* - Berkeley Earth, an independent climate science research organization, today released its Annual Global Temperature Report for 2023, finding that 2023 was the warmest year on record, surpassing the previous record set in 2016. 2023 is also the first year in the Berkeley Earth dataset to breach the 1.5°C warming threshold.

2.3 billion people - 29% of the Earth's population - experienced record warmth at their local level in 2023. In addition, 77 countries, including China, Nigeria, South Korea, Brazil and Kazakhstan set new records for national annual average temperature. There were no areas on Earth that experienced a record cold year. The last nine years have been the nine warmest years on record.

2023's extraordinary warmth was driven by natural variation on top of long-term warming caused by man-made greenhouse gas emissions. The emergence of a strong El Niño pattern in the eastern Equatorial Pacific, along with 1-in-100 year temperature anomalies in the Northern Atlantic sea surface temperature combined to produce significant warmth, particularly in the second half of 2023. Recent warmth has caused some to speculate that the rate of global warming is accelerating. Current trends in land and ocean surface temperature do not yet show clear evidence of acceleration, though continued close scrutiny of the rate of warming in coming years is justified.

"2023 is definitely a major misfit to the model, but it remains to be seen if 2023 is merely an unusual outlier or if it is an indication of unexpected changes ahead" said Berkeley Earth Lead Scientist Robert Rohde.

With an estimated global average temperature at  $1.54 \pm 0.06$  °C ( $2.77 \pm 0.11$  °F) above the 1850-to-1900 pre-industrial average, 2023 was the first year on record in the Berkeley Earth dataset to exceed the warming target of 1.5°C established by the Paris Agreement. While this target is based on the state of the climate averaged over many years, exceeding 1.5 °C in 2023 is a stark warning sign of how close the overall climate system has come to exceeding the Paris Agreement goal.

“With greenhouse gas emissions continuing to set record highs, it is likely that the climate will regularly exceed 1.5 °C in the near future,” said Rohde.

2023 was also notable for:

- Record annual average warmth in both the land and ocean records;
- Particularly extreme warmth observed over Central and South America, parts of Asia, and the North Atlantic;
- Record low Antarctic sea ice during the Antarctic winter;
- Seven months with monthly averages at least 1.5°C/2.7°F warmer than their 1850-1900 pre-industrial average;
- The largest monthly global average anomaly ever observed at 1.84°C warmer than the pre-industrial average in September 2023.

Based on historical variability and current conditions, it is possible to roughly estimate what global mean temperature might be expected in 2024. While in general the second year after an El Niño emerges is expected to be warmer than the first, the unusual characteristics of 2023 may make it difficult for 2024 to warm further.

We currently estimate that 2024 is likely to be similar to 2023 or slightly warmer. With the ongoing El Niño conditions, and the typical lag between peak El Niño and peak global temperature response, it is likely that 2024 remains relatively warm. However, a swing towards La Niña in late 2024 is possible and could ultimately serve to mitigate temperatures some.

Berkeley Earth will be transitioning to an [updated high resolution analysis](#) in 2024, which will improve our ability to characterize local, regional, and national changes, and reduce uncertainties associated with topography and small-scale weather variability. At 0.25°x0.25° of spatial resolution, this updated product will be the highest resolution instrumental data set available, providing unprecedented accuracy and insight into warming trends at the local level.

#### **Further Information:**

The full text of the 2023 Global Temperature Report is available here:

[www.berkeleyearth.org/global-temperature-report-for-2023](http://www.berkeleyearth.org/global-temperature-report-for-2023)

National-level warming projections and emissions trends can be found here:

<https://berkeleyearth.org/policy-insights/>

**About Berkeley Earth:**

Berkeley Earth is a California-based 501c3 non-profit research organization renowned for its commitment to independent climate science and analysis. Founded in 2013, the organization has led the development and application of AI and advanced statistical methods to the analysis of environmental data. Berkeley Earth's approach to climate science combines rigorous data analysis with a transparent methodology, providing clear and unbiased information about global temperature changes and their implications. Referenced by the UN IPCC and contributing regularly to leading climate journalism, Berkeley Earth plays a crucial role in informing public understanding and policymaking on global temperature trends, contributing significantly to the global discourse on climate change.