# Summer 2023 Identified as Hottest in Northern Hemisphere in Over 2,000 Years



Summer 2023 has been identified as the hottest in the Northern Hemisphere in over 2,000 years, according to research published in the journal *Nature*. Scientists from the University of Cambridge and Johannes Gutenberg University Mainz conducted the study using tree ring data alongside weather observations and early records. The summer months of June, July, and August 2023 were at least 0.5°C hotter than the extremes of a naturally varying climate and approximately 4°C warmer than the coldest summer in 536 AD, a period influenced by a volcanic eruption.

The study indicated that summer 2023 temperatures were 2.07°C higher than the pre-industrial period of 1850-1900, a baseline used to measure global warming. A significant factor contributing to this exceptional heat was the El Niño weather pattern in the Pacific, which intensified the effects of human-induced climate change.

Professor Ulf Buntgen from Cambridge emphasized the dramatic increase in temperatures through historical context, while Professor Jan Esper from Mainz highlighted that the warming, exacerbated by greenhouse gases and El Niño conditions, leads to prolonged heat waves and droughts. The researchers warned that such trends will persist unless there is a significant reduction in greenhouse gas emissions.

The summer of 2023 surpassed long-term averages from AD 1 to 1890 by 2.2°C. The previous warmest summer, recorded in 246 AD during a Roman warm period, was cooler by 1.19°C compared to 2023.

These findings underscore the unprecedented nature of current global warming. The study signals that the temperature rise limit of 1.5°C above pre-industrial levels, aimed at under the Paris Agreement, has already been exceeded in the Northern Hemisphere.

The current El Niño is forecast to persist into early summer 2024, suggesting that record-breaking temperatures might continue. The study involved the analysis of tree rings from around 10,000 trees across nine regions in the Northern Hemisphere, excluding the Tropics. This method offers a high-resolution record of past temperatures that instrumental data alone cannot provide, underscoring the severity of recent climate changes.